

# MAKING BEAUTIFUL BRAS

*by Lee-Ann Burgess*



# Making Beautiful Bras

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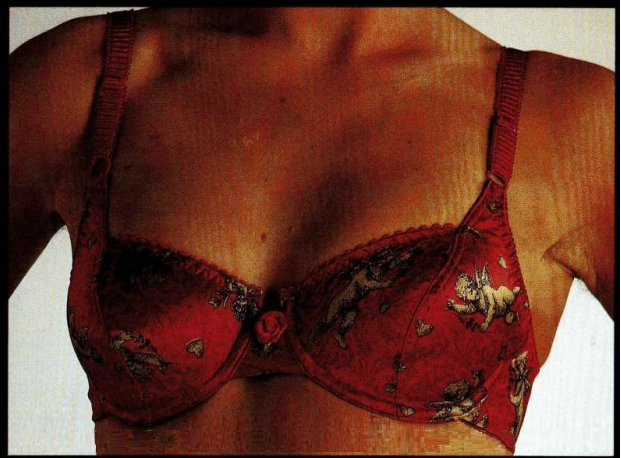
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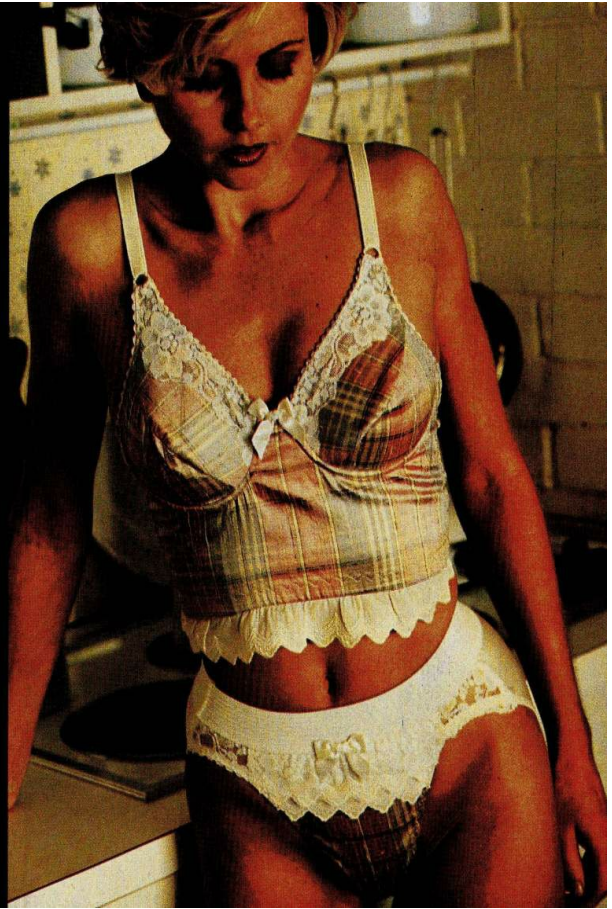
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*This book is dedicated to my two lovely sons: Mark and Joseph, to my wonderful husband Rod, (who believes in me) and last but certainly not least, to the God and Father of my Lord Jesus Christ, who loves all the overweight women just as much as He loves all the slim ones!!!*

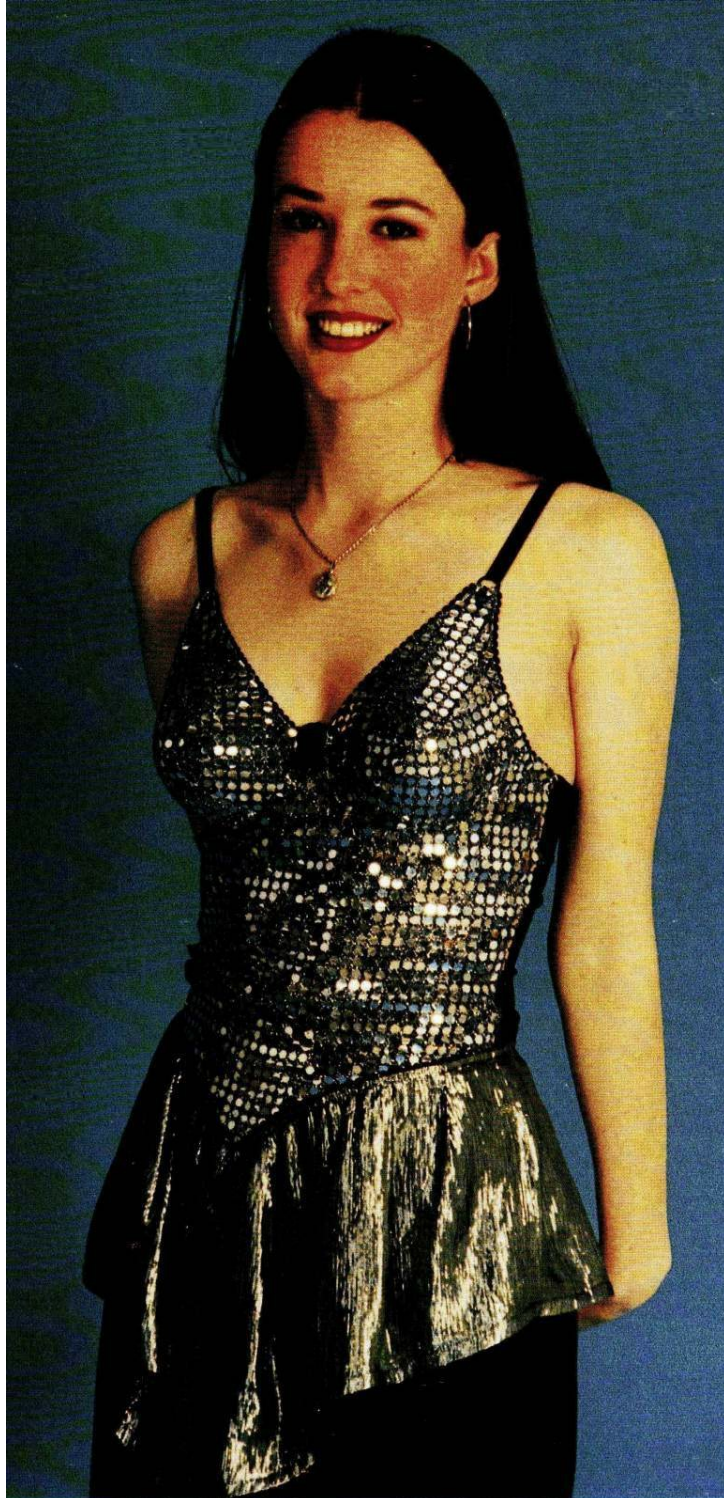
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# INTRODUCTION

## MY APPROACH TO BRA MAKING

[page 1]

My technique of bra making is based on ***cloning a beautifully fitting manufactured bra***. Cloning an existing bra is far less risky than purchasing a commercial bra pattern and making it up in your size. The whole approach of measuring your body with a tape measure and making up a bra pattern in your size is fraught with difficulty.

If buying a bra only required buying the right size, it would be a simple matter of selecting the right sized bra in the shop and purchasing it without even the need to try it on. Unfortunately, a bra is such an exact-fitting undergarment, and there are so many different combinations of breast shapes and sizes and different ribcage shapes and sizes, that to obtain a perfectly fitting bra, in most cases, many different bras have to be tried on. The same logic applies concerning a bra pattern. In most cases, an ***individual bra pattern*** has to be drafted. Simply purchasing a commercial bra pattern and making it up in your size is like trying to win a lottery.

***Breasts not only vary in size, but they vary in shape, and in the way the breast tissue is distributed on the ribcage.*** Some breasts are naturally very rounded and high-set on the ribcage, and others can be naturally very pendulous and low-set on the ribcage. Some breasts are very closely spaced on the ribcage, with a deep natural cleavage, and others can be very widely spaced on the ribcage, with 1 or 2 inches of flat chest area in between the breasts. All of these shape variations have to be taken in to account and are extremely important when drafting a bra pattern. A tape measure cannot hope to accurately describe these shape variations. That is why two women may have the same underbust and full bust measurements, but may require totally different bra patterns: one figure may be very broad-backed/narrow-fronted and the other may be very narrow-backed/wide-fronted. Their breasts may also vary greatly in shape.

If you have a favourite bra that fits you/supports you very well and is very comfortable, then its pattern can be accurately drafted by cutting the bra up



along the seam lines, ironing the pieces flat, and then tracing the pieces and adding your seam allowances. Even an old bra will produce an accurate pattern in this way, even although the bra back is all stretched.

The process of cloning a favourite bra involves:

- obtaining the best-fitting available bra,
- accurately drafting its pattern, (and modifying the pattern where necessary to improve its fit/design) and
- using identical or near-identical cup fabrics to those in the original bra, when the new bra is sewn.

***The fundamental question arises, 'What constitutes a good fit in a bra?'***

Without well fitting, supportive bras, over a period of time, gravity takes a hold, stretching the skin, muscle and breast tissue, producing a very aged-looking, 'droopy' bustline at best, and at worst, long, pendulous, breasts that hang down past our waists. I have found that a vast number of women are understandably, completely ignorant on this subject. Their mothers haven't educated them about the fit of their bras, and they in turn, haven't been able to educate their daughters in this aspect of life. Our mothers couldn't teach us what they didn't know themselves.

It is vitally important that our bra pattern be drafted from a bra that is the best fitting one available.

***Knowing what constitutes a good fit in a bra is not only necessary in order to choose the best fitting bra available, but is also necessary in order to identify any design inadequacies that need to be corrected when we draft our bra pattern.***

Regardless of whether we are going to buy our bras, or sew our bras, it is important that we be able to confidently distinguish between a good fit and a poor fit in a bra. Relying on sales assistants in department stores to fit us with a bra is just not good enough. I have seen far too many dreadfully fitting bras that are the product of such a shop 'fitting.' We need to rely on our own informed judgements, and make our own decisions regarding the type of bras we wear.

So, for a number of reasons, it's time to was thoroughly examine this subject!

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## DESCRIPTION OF A WELL-FITTING BRA

### ***It will have a pleasing cup shape.***

Breasts are a fairly soft part of our bodies and will to a large extent adopt the shape of whatever bra cup is put onto them. Even so, the most successful bra is the one that combines well with the natural shape of our breasts and the distribution of breast tissue on our ribcage, working with that natural shape and enhancing it.

### ***It will produce good breast uplift or support.***

The breasts should be firmly held against the chest wall in a reasonably uplifted position. The breasts should not be allowed to droop downwards so that they lie against the front of the chest. Reasonably uplifted breasts generally give a youthful, slimming appearance to a woman's figure, and are better for our overall posture. To assess the amount of uplift a bra provides, view your figure in the mirror in profile (standing side-on).

### ***It will produce adequate breast separation.***

The breasts should not be squashed together down the cleavage (having no separation at all), nor should they be forced apart so that there is excess breast bulk in the underarm region. In a successful bra, the breasts will 'face towards the front', and the side of the cup will be nice and flat so that if marching in a parade, we would be able to freely swing our arms backwards and forwards.

### ***It will have cups that are large enough to fully contain the breasts.***

Each breast should be able to go completely down and out into the cup. If the cup volume and shape are correct:

1. the centre front part of the bra will sit in snugly against the sternum/rib cage,
2. there will be no ugly bulging of the breast over the neckline or armhole edges, and
3. there will be no 'skin-against-skin' under the breast.

If the cup volume is inadequate and/or the cup shape is too shallow to accommodate the fuller shape of the breast, the breasts will be compressed downwards against the front of the chest, creating a hot, moist, airless skin-against-skin area underneath, which produces heat rashes, scalding and fungal infections.

***If the bra is underwired, the underwire should sit where the breast meets the ribcage, in the body's natural the 'wire line crease.'***

A well-fitting underwired bra is 'heaven' and an ill-fitting one is 'hell' to wear. If the underwires are a good fit, they shouldn't be able to be felt when the bra is worn. Some breast shapes are not suited to underwired bras, i.e. where the distribution of the breast tissue on the ribcage extends significantly around into the underarm region. In this case, underwires can press into the breast tissue and are very uncomfortable, so a beautifully fitting non-underwired bra should be sought.

When assessing the fit of an underwire, it is important not to view the underwire in isolation, and to be aware of the fact that if the underwire is an unsuitable shape or size, another underwire can be chosen and your bra pattern modified accordingly.

A good fit in the rest of the bra (an adequate cup volume and a firm bra back) is necessary in order to accurately evaluate the shape and size of an underwire.

A poor cup fit can adversely affect the fit of an underwire.

In many bras that seemingly have ill-fitting underwires, the shape and size of the underwire is only part of the problem. The cup fit is the other variable that needs to be scrutinised. Consider the case where there is insufficient cup fullness to allow the breast to fully go down and out into the cup. The breast tissue is squashed inwards against the ribcage, producing among other things, an excess amount of breast bulk pushed back into the underarm region. Not surprisingly, the underarm wire upright is then sitting on top of breast tissue, leading us to jump to the premature conclusion that it is the underwire shape that is at fault. In this instance, it is not until the cup volume has been sufficiently increased that the shape of the underwire can be accurately assessed.

A poorly designed or poorly fitting bra back can also adversely affect the fit of an underwire.

In a perfectly fitting bra, the bra will fit very firmly around the ribcage. Both the upper and lower edges of the bra back in the underarm area will be quite tight on the body, with no slackness or gaping present. The tension in the bra back fabric will slightly splay the uprights of the underwires apart, pulling the side upright back behind the breast tissue so that it can sit right in against the ribcage. When the side upright is positioned just a fraction behind the breast tissue, it will not be able to be felt when the bra is worn. If the bra back is poorly designed, producing a slack upper edge on the bra back, or when the bra is so old that the bra back is completely over-stretched and loose around the ribcage, the underwire will not be sufficiently splayed when the bra is worn. When this happens, the side upright of the underwire will come forward on the body, sitting on top of breast tissue, and then the underarm wire tip will continually catch on the inside of the upper arm.

***The centre front wire uprights should sit in flat against the sternum/chest wall instead of protruding.***

If the centre front wire tips stick out, this isn't necessarily an underwire problem, but is most often an indication that the cup volume and/or cup shape is inadequate to contain the fullness of the breasts. Another cause of this problem is a long, slack neckline edge that allows the centre front wire tips to fall forward/away from the chest wall. A snug neckline edge will pull the centre front underwire tips in, provided there is sufficient volume in the cups to accommodate the bulk of the breasts.

***The underarm wire uprights should not sit on breast tissue, press into breast tissue, rub against the inside of the upper arm, or skewer the armpit.***

The side upright of the underwire should be positioned either just on the edge of the side of the breast, or just slightly behind it. To determine where breast tissue ends, press your thumbs into the sides of your breasts, and then move your thumbs gradually back towards your underarm region, pressing in as you move them back. When doing this, you will notice that there is a point at which the breast tissue ends, and the fat-over-ribcage



begins. When we put our bras on, they are a very firmly fitting garment that is essentially 'strapped' onto our rib cage and if both of the underwire uprights can possibly sit in snugly against our rib cage, they will. The two things that will prevent them from doing this is and inadequate cup volume, and an incorrectly shaped underwire. If the underwire shape is too deep of a U, and its cup does not have sufficient horizontal coverage on the body, the side underwire upright will be sitting over breast tissue when the bra is worn. Because of this, it will not be able to sit in properly against the rib cage, and the underarm wire tip will continually catch on the inside of the upper arm.

I have found that many manufactured underwired bras contain underwires that are too deep a U shape.

With this type of underwire:

- the side uprights are too close together, which produces a side upright that sits on breast tissue, leading to the situation discussed above, and
- there is a gap between the lowest point of the underwire under the cup, and the body's natural wire line crease, producing a strip of unusable lower cup at the base of the breasts and underwires that sit down on the front of the chest.

***Its shoulder straps should not fall over the shoulders and they should be wide enough to avoid 'digging a ditch' at the top of the shoulders.***

To address both of these problems, wider, good-quality elastic shoulder strapping should be chosen for your bras. It will not only make your bras so much more comfortable to wear, it will also help prevent neck aches and headaches. Poor quality bra shoulder strap elastic and especially non-stretch shoulder straps cause more health problems than many women are aware of. This fact was clearly pointed out to me when a student in one of my weekend bra making workshops told me that she suffered persistent and debilitating migraine headaches. She had been to doctors and chiropractors many times, all to no avail. Her bra size was a 14DD (36DD), and she was a beautiful young girl in her early twenties. In the workshop she sewed her new bra and used the shoulder strapping that I provided in her kit ... only a

medium-width, 19mm wide, good quality elastic strapping (the widest strapping that I sell is 25mm wide). When her bra was completed, she was very pleased with it: it fitted beautifully and needed no alterations.

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She wore this bra every day of the following working week. It was so comfortable, she didn't want to go back to wearing one of her bought bras (which by the way, were still in good condition and fitted her reasonably well). Throughout this week, she didn't suffer from one headache.

When Saturday came, she decided to wear one of her old bras while she washed and dried her new bra and gardened for an hour or two. After wearing one of her older bras for about 15 minutes, she felt all the muscles in her neck contracting/tightening, and the beginnings of one of her migraine headaches coming on. She rushed inside to take her bra off, convinced that it was her bras, and more particularly their inferior quality shoulder strapping, that had been causing her headaches. That same weekend, she made another bra for herself. When I saw her a few months afterwards, she told me what had happened. At that time, she had not suffered a migraine headache since before our workshop and was absolutely delighted!

Many young girls object to having wider shoulder strap elastic on their bras, thinking that it will make them look matronly and unattractive. I encourage them to have two kinds of bras:

1. every-day 'working' bras that are comfortable and practical as well as attractive, with strap elastic a little wider than what they may be used to, and
2. glamorous, narrow-strapped bras for special occasions.

***Its bra back shouldn't 'ride up' on the body.***

The support and uplift that a bra provides, depends on the bra back just as much as on the cups.

Generally speaking, manufactured bras have very insubstantial, narrow bra backs, made out of only light to medium weight fabric, with fairly narrow lower edge edging elastic. Skimping on quantity and quality like this

increases the manufacturer's profit margins, but produces a garment back which has to stretch to its maximum length whenever the bra is worn. Consequently, this type of bra only lasts 12 to 18 months before becoming all loose and stretched out of shape. At this point we tighten the hooks and eyes as much as possible, but even on the tightest position, the bra is still too loose around our ribcage and the back 'rides up,' allowing our breasts to droop forward. In a desperate attempt to increase uplift, we then tighten the straps, but this only pulls the weak bra back further upwards. Sound familiar? Over a period of time, we collect a drawer full of bras that have perfectly good cups, but hopelessly stretched-out backs.

I used to think that only the larger women such as myself had this problem, but I have since discovered that smaller breasted womens' bra backs wear out just as quickly. It wasn't my fault, but the fault of the manufacturers. The solution to this problem is to design and make, stronger, more substantial backs in our bras. A bra cup can only fully support our breasts if it is attached to a proper bra back that doesn't ride up our back. Many women underestimate the importance of the bra back and the importance of its design. The shape of the bra back should be deeper and its lower edge should be angled down at the centre back to take full advantage of the tapering-in of the ribcage nearer to the waist. Having a more substantial back in our bras will mean that the height of the hook/eye tab at the centre back will be a little higher than normal. A heavier-weight spandex or powernet in the bra back, and at least 19mm-wide scalloped elastic along the bra back's lower edge will provide added strength. To accommodate the heavier-weight fabric that will contain less stretch than the spongy, lighter fabrics used by the manufacturers, the length of the bra back pattern piece will have to be slightly extended in the underarm region, so that the bra can be done up comfortably around the ribcage. When making bras for my clients, I use surgical corset powernet in the bra back, so that they will last three to five years. If the bra back is the correct length around the rib cage, the bra should be initially done up on the loosest bank of eyes, or Alternatively, the middle bank of eyes. This is so that when the bra back fabric 'gives' or stretches a little after washing and wearing, the hooks can be done up onto a tighter set of eyes, and the bra will still fit snugly around the ribcage.

## FOCUS ON CUP FIT

Now that general aspects of a bra's fit have been outlined, it is necessary to specifically analyse the importance of the fit of the cup, because ***the cup fit of the bra you choose to draft your pattern from, is vital to the success of your bra pattern.***

***Searching for a bra that has good pattern making potential, is very different to the process most of us go through when looking for a bra to purchase and wear on a daily basis.*** This is because there are some aspects of a bra pattern that are very easily altered, and other aspects that require a high degree of expertise to successfully modify.

As a bra maker, I recognise that ***the fit of the three-dimensional bra cup*** is critical to the success of the pattern, so when evaluating the pattern-making potential of any bra, the fit of the cup, and in particular, ***an adequate cup volume*** is what I primarily look for. So when each bra that is tried on, I make sure that my client has properly gotten into the cups (refer to [page 7](#)) and then I look for the obvious tell-tale signs of insufficient cup volume:

- bulging over the neckline and/or armhole edges
- skin against skin under the cup, and
- the centre front of the bra not sitting right in against the chest wall.

The most sensitive indicator of sufficient cup volume is whether or not the centrepiece of the bra sits in closely against the chest wall.

By selecting the bra that has a cup volume that best matches the size of the breasts, I will be choosing the cups that will need the least number of difficult alterations done to them. Obviously, the more changes that need to be made to the cup volume, the greater the risk involved.

***If the breast size seems to be exactly ½ way between cup sizes, and it is a choice between a cup that is a ½ cup size too small, and a cup that is a ½ size too big, I often choose the cup that is too big,*** and reduce the cup volume by darting the cup. This is because it is easier to accurately reduce the cup volume, than to substantially increase the cup volume.



***The height of the neckline and armhole edges and the shape and length of a bra's back, are very easily altered*** as they involve flat or two-dimensional areas of a bra. Because an adequate cup volume is of paramount importance, deficiencies in the above areas, can to a large extent be ignored when searching for a bra to draft a good pattern from. To illustrate this point, imagine trying on a bra whose armhole edge is too high and is 'cutting in' at the front of the armhole when we move our arms forward. This bra is a perfect fit in all other aspects and provides good uplift/support, but because it would be totally unwearable, we normally wouldn't purchase it. This is where the processes of selecting a bra to draft a pattern from, and ordinarily purchasing a bra in order to wear, will differ greatly. If the cup volume in this same, unwearable bra was a terrific match to the shape and size of our breasts, it could produce a marvellous pattern, and should definitely be purchased! 'Scooping out' or lowering the armhole edge of the bra pattern is very easily done and involves very little risk. (Refer to [page 44](#)).

If you're not sure whether the bra you intend to draft your cup pattern from has properly fitting cups, let me encourage you to visit the lingerie section of the largest department store you can get to, and try on lots ... and lots ... and lots of bras! If you happen to find a bra that has beautifully fitting cups that give you much more uplift/support and a far more flattering shape than anything you have yet owned, then it's a good investment! It will produce a wonderful cup pattern for a 'batch' of custom-made bras. Don't be intimidated by the sales assistants. The bra manufacturers are always bringing out new designs, so it's a good idea to see if any of their latest designs (or older ones for that matter) work well for your figure.

Simply explain that you are searching for the best fitting, most supportive and best-shaped bra cup. (note: not bra!)

If a sales assistant questions your total unconcern about the fit of the bra back, or any other aspect of the bra, inform them that you are a competent seamstress and are capable of making any alterations required. Only buy a bra if it meets your stringent cup-fit requirements.

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***CUP FIT .... NOT BRA FIT***

A bra size has two components ... the number: indicating the size of the ribcage, and a letter of the alphabet: indicating the size of the breasts. There are a few different methods of determining your bra size, but whichever method you use, it is only a rough guide at best.

Relying on a tape measure in order to fit a bra has the serious limitation of not being able to differentiate between shape variations. ***Many ladies I have fitted are a different size across the front of their ribcage, than what they are across the back.*** There is a real size discrepancy between these two parts of their body and this makes it impossible for them to buy a bra that fits properly because they can't obtain a good cup fit and a good ribcage fit in the one bra. They are dissatisfied with their uncomfortable, ill-fitting bras, and in many cases, don't understand why this situation has occurred. Where this is the case, it is the fit of the cup which has to take precedence over the fit of the ribcage, and the bra which is chosen as the basis of the pattern, may either be too big or too small around the ribcage.

Some ladies may be ***broad-backed*** e.g. being a size 14B across the front but being a size 16 or 18 across the back. In this case I would choose the 14B bra as the basis of a bra pattern, and extend the length of the bra back in the underarm region so that it was comfortable around the ribcage.

Alternatively, your figure may be ***narrow-backed***. One of my clients requires a 20I cup pattern combined with a size 12 bra back. This extraordinary example illustrates just how unusual our body shapes can be and the need for a more individual approach to bra fitting.

One of my friends came to me for a bra fitting and I discovered that she has a very narrow-backed figure. She is a size 10 across the back, but her front is a generous size 12E (including the cups). She only owned a size 10D and a 10DD bra, neither of which were satisfactory. I could see how this situation had developed: bras in size 10E, 10EE and 10F are nearly unobtainable for the average person. My friend wasn't even aware that such sizes existed, let alone that one of these sizes might have provided her with a better fit. Ordinarily she would never even consider trying a size 12 bra, because size 12 bras are always too loose around her ribcage, even when done up on the tightest eyes. Some sales assistants tell women in her situation to put a

'tuck' in the back of a 12E bra, but as the customer's sewing skills are often very rudimentary, they know the result would be a bulky, ruined, ugly-looking garment that they have only just paid 'top dollar' for.

If you normally wear a 14C bra, just out of curiosity, try on some 14D, 16C and even 16D bras as well. Remember you are looking for the ***perfect cup*** to suit your breasts' particular shape and size! If a size 16E cup is too small to fully accommodate your breast and there is no 16F size in that particular design, try on the 18E, the 20E, or the 22E... in order to obtain a cup that fits. Don't pay undue attention to the size printed on the tag, as it's only a very rough guide.

***It is good to be aware that there is no standardisation of sizing in the bra industry.***

It is an aggressive, competitive atmosphere out there in the corporate world, and the bra companies, each vying for a greater slice of the market, don't get together to discuss sizing. Consequently, you may find that you fit into a few different sizes of bras depending which brand you are trying on, and may even vary in size within the one brand, depending on the cup style and the amount of give or stretch contained in the cup fabric. Let's not be restricted by our approach. Just because we may once have fitted into a 14B bra (whatever that was!) it doesn't necessarily follow that we should be wearing that same sized bra today. Our body shape can change, as do bra styles and cup fabrics.

I have found that many women are wearing bra cups that are far too small to accommodate their breasts. Many women have an extremely rigid, inaccurate idea of their bra size, often considerably underestimating their true cup size.

It is essential for our general health that we wear supportive, well fitting, comfortable bras, and if the size on the tag bothers us, let's cut the tag off - it's nobody's business but ours.

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## HOW TO PUT A BRA ON

This seems at face value, to be a self-explanatory subject, but it has become

associated with a surprising amount of misinformation and therefore needs to be dealt with. When trying bras, in order to select the one you will draft your bra pattern from, make sure that you have put each bra on correctly so that your final decisions are based on accurate observations concerning the fit of the cups.

***It is of no importance whatsoever, how you actually get the bra onto your body and then do up the closure (hooks and eyes).***

You may wish to put the bra on, reach around to your back, and do the hooks and eyes up, relying on 'feel' to ensure that they are done up correctly. Alternatively you may wish to drape the bra around your waist 'back to front,' do up the hooks and eyes, swivel the bra around your body until the closure is positioned at your centre back, and then pull the bra upwards until it is correctly positioned on your ribcage. Neither method is better than the other, although having short arms combined with a wide ribcage, or having arthritis in the shoulders, arms or hands can make the first method more difficult.

***What really matters is how you get into the bra once it is on!***

It is vital that your breasts be allowed to go ***down and out into the cups*** as much as possible. Only when your breasts are ***fully into the cups*** can you accurately assess the fit of those cups. The following method is the one that I have found to be the most successful.

Once the bra is on and the closure is done up:

- lean forward, bending over from the hips so that the breasts are 'falling downwards' into the cups.
- Whilst in this bent-over position, place your right hand (with the fingers positioned straight out and together) under the left shoulder strap, and move your hand down into the side of the left breast cup, between the fabric of the cup and the breast.
- Cup your hand slightly, so that it goes a little under the left breast, and gently lift the left breast up into its cup.
- At the same time, with your left hand, position the underwire of the left breast cup so that the under-wire sits right under the left breast, up where the lowest part of the breast ends and the ribcage begins



(in the natural wire line crease).

- Use your left hand in a similar manner to lift the right breast out into its cup. The breasts are now out into the cups ... so now ...
- Stand up and allow each breast to go fully down into its cup. ***Using both hands, lift each upper-cup (one at a time) slightly forwards, away from the body and gently 'shake' the breast/cup, letting the weight and bulk of the breast settle down into the cup.***
- ***Ensure that there are no folds/pleats in the cup fabric, especially in the lower cup fabric.***

Because each hand is inserted down into the side of each cup, between the cup fabric and the breast, (in order to lift the breasts up into the cups), the above method has the advantage of encouraging the breasts to 'face towards the front' thereby reducing excess breast bulk in the underarm region.

Now you know how to: evaluate the fit of a bra and most importantly its cups, and put a bra on properly. From here on, I will assume that you have selected your 'pattern' bra. ... the bra with the best fitting cups (the bra from which you will draft your bra pattern).

[page 8]

***Now that you are bra-savvy, when trying on bras in the shops, let me encourage you to fit yourself with your bras, instead of allowing the sales assistants to help you.*** Relying on your knowledge of what a well-fitting bra cup should be like, and being in firm control of the situation, will leave you less vulnerable to manipulation. Many aspects of the process of being fitted with a bra render the customer vulnerable. In order to minimise the rate of shop-lifting, many stores will only allow customers to take about four bras into the fitting rooms at one time, which really discourages customers from exhaustively searching for the bra or a bra cup that gives the best possible fit. If the customer wants her privacy when trying on these undergarments, she has to get re-dressed after she tries on every fourth bra or so, before going out to the lingerie department again to select the next four garments to be tried on. This makes the whole process as exhausting and inefficient as possible, manipulating the customer into letting the sales assistants control

the whole fitting process, and thus boosting sales figures.

Being fitted by the sales assistants puts us in an obligated, vulnerable position. Imagine the situation where the sales assistant has brought in 30 to 50 bras for you to try on (a not unreasonable number if you are an unusual shape or size). She has been pleasant in her manner, very helpful in selecting all those bras for you, has spent the last 40 minutes or so of her time with you, and has patiently put all the unsatisfactory bras back on their little coat-hangers and taken them back out to the shop floor. She says that one or two of them were a 'good fit', but in your heart, you really weren't happy with the fit of any of them. For you to then speak your mind and say so, would seem ungrateful and insulting (after all, she should know what a good fitting bra is supposed to be like... she did a course on the subject and has 'training'). In such a situation, most women feel under such an obligation, that they end up buying at least one bra. You would be a very confident woman indeed if you could thank her for her effort and time, but assertively and yet graciously insist that none of those bras fitted well enough to induce you to part with your hard-earned cash.

A huge number of women are far too emotionally vulnerable to behave so confidently in such a situation. This especially applies to women whose bra problems often reduce them to tears or to women who want to feel that they will be welcome to visit that same store in the future in order to keep searching for the ultimate bra. So, in order not to be manipulated into such a vulnerable position, it is far better to do the fitting yourself.

Being a very stubborn, independent female, I tend to completely disregard the notice concerning the maximum number of bras to be taken into the fitting rooms and take as many as I like, placing the onus on the sales assistants to prevent me. If they do have the confidence to confront and stop me, (which by the way, no-one has yet done) I would offer to let them:

- count the number of bras I am taking in with me (both before and after I have tried them on),
- search my bag (after I have tried on all the bras I wish to), and
- I would assure them that I am a person of integrity, and promise faithfully to neatly hang up all the bras in their correct positions

after I have finished with them.

- I would assure them that if any of the bras meets my stringent cup-fit requirements, I would certainly be purchasing them (I am not there merely to waste time).

Stating that 'I am not doing anything illegal', 'what happened to 'the customer being always right?', and 'don't they want my custom?' etc. could also be beneficial in this situation. To be uncompromisingly assertive but at the same time, very gracious is the aim. The sales assistants are there to assist you in your purchase... and the way you wish them to assist you is just to do a simple count of all the bras you are taking in to the fitting rooms, before and after you have tried them on.

If satisfaction and co-operation from the sales assistants is not forthcoming, a penetrating, clearly-annunciated, and if necessary, loudly-spoken (and yet as gracious as is possible), complaint about how unhelpful and uncooperative they are being (so that lots of other customers can hear) and another loudly-spoken demand to speak with the head of the department is called for. Take your time, ***have a very pleasant but firm tone in your voice***, maintain your self-control at all times, don't get angry, don't speak too quickly, and don't be afraid to repeat yourself. Go to the person in the highest authority in the store if necessary. Remember, you are there with the aim of purchasing one of their products, and to enable a sale to take place is their aim as well.

[page 9]

## BRA PATTERN MAKING

Because a bra is such an exact-fitting undergarment, the success of bra making depends not only upon precision sewing, but also on the following:

- ***Producing a beautifully drawn, accurate pattern of all the bra pieces*** (especially the ***cup*** pattern pieces). The ***shape*** of each pattern piece is just as critical as its size. Each nuance of the curved edge of each cup pattern piece is important and will affect the ultimate shape of the breast within the bra cup. There are only two types of pre-loved bras that are you will not be able to draft an accurate

pattern from:

- a bra that has unlined stretch lace cups, where the pieces of stretch lace have been 'worn-to-death. ' With this type of bra, the fatigued, over-stretched lace cup pieces will not give an accurate indication of the original shape of the cup pattern pieces.
- a bra that has unlined, unbonded, microfibre or silk cup fabric. Because these are such 'fluid,' 'unstable, fabrics, the individual cup pieces will continually change shape, depending on the way they are laid on a surface, making it impossible to ascertain the original shape of the cup pattern pieces.

***To obtain an accurate cup pattern***

- \* The cup pieces should be cut out of the bra body (along the seam line that joins the cup to the rest of the bra).
- \* any elastic or top stitching along an edge should be either unpicked/removed, or clipped through with sharp scissors at short intervals, and then
- \* ***the cup pieces should be ironed*** with a warm iron so that they are perfectly flat before they are traced.
- ***An accurate analysis of the stretch/give properties of the cup laces/fabrics in the original 'pattern' bra has to be made if your pattern bra is to be successfully replicated.*** This is because your 'pattern' bra's cups rely on every bit of give or stretch contained within their fabric/lace, in order to beautifully accommodate and support your breasts' shape, size and weight. Therefore, using cup fabric/lace with different stretch properties will alter both the available cup space, and the shape of the breast within the cup. It stands to reason that if a tighter, more rigid type of cup fabric/lace is used with the pattern, available cup space will be reduced, and if a more stretchy type of fabric/lace is used in the cups, the available cup space will be increased.  
Only when the fabrics are identified and/or their stretch properties are analysed, can identical fabrics be chosen for use in the bras made using your new pattern. ***The same cup fit/shape can be obtained if the shape and size of the cup pattern pieces is identical, and identical types of cup fabrics/laces are used.*** If the identical cup



fabrics are unavailable, a readily available cup fabric that has identical or very similar stretch properties can be selected and used when your new bras are sewn. When your bra pattern is drafted, it is not only important to write on the cup pattern pieces what type of fabric/lace is to be used, it is also vital that ***the direction of greatest give/stretch be clearly indicated on each pattern piece with a labelled arrow.*** The direction of the greatest give or stretch within the cup fabrics will greatly affect ***the shape of the breast within the cup when the bra is worn.*** As a general rule, the direction of greatest give/stretch runs ***vertically on the lower cup*** (producing more breast uplift) and the direction of greatest give/stretch runs ***across the upper cup, parallel to the cup's neckline edge.*** Horizontal give or stretch in the upper cup can help achieving two objectives: to prevent the neckline edge from cutting in, and allowing the upper cup to expand horizontally (producing an attractive, rounded shape). It should be stressed that this is only a general rule and does not apply to every case. If the manufactured bra that you have chosen as the basis of your pattern is different to this, then ***follow the bra, not the arbitrary rule.*** When cloning a successful bra, only deliberate, discerning changes should be made.

The following instructions are for drafting the pattern of an underwired bra, so if your pattern bra is non-underwired, proceed to [page 38](#) for your pattern making instructions.

[page 10]

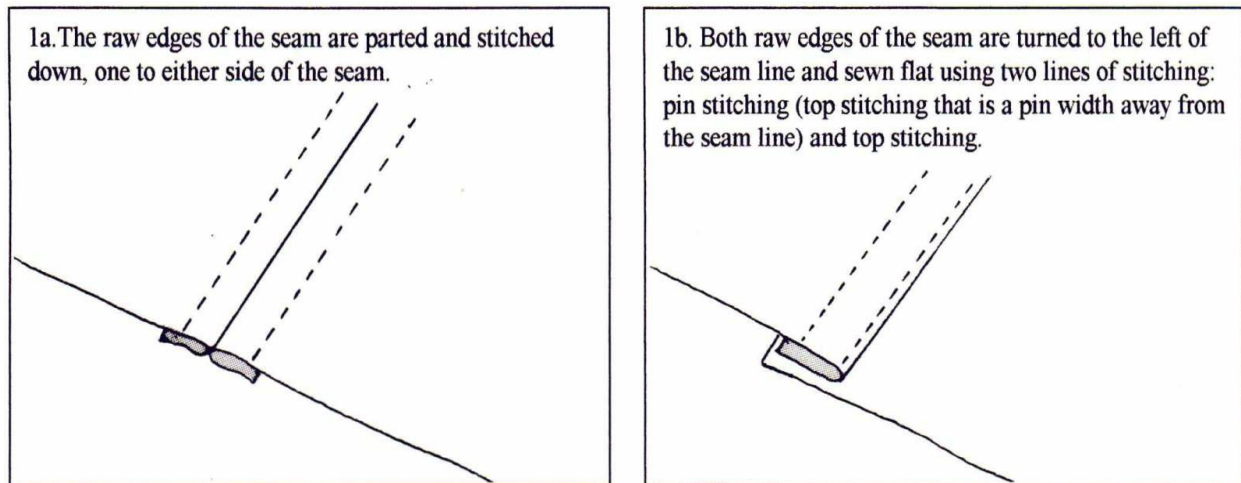
## DRAFTING THE PATTERN OF AN UNDERWIRED BRA

### STEP 1: MARK ALL THE SEAM LINES ON YOUR BRA

***To prepare the bra, using a fine point felt-tipped marker, draw along all the seam lines and outer edges of the bra.***

If your bra is dark in colour, trace over the seam lines using either a line drawn in liquid paper (correction fluid) or dots of liquid paper. These lines, when drawn onto your bra, will clarify where the seams are, as well as a definite line to follow when tracing.

Keep in mind that **a seam line is where one piece of fabric meets another piece of fabric**, not where the lines of top stitching are. The top stitching only indicates the direction in which the raw edges produced by the seam have been turned, in order to be sewn flat onto the underside of the garment.

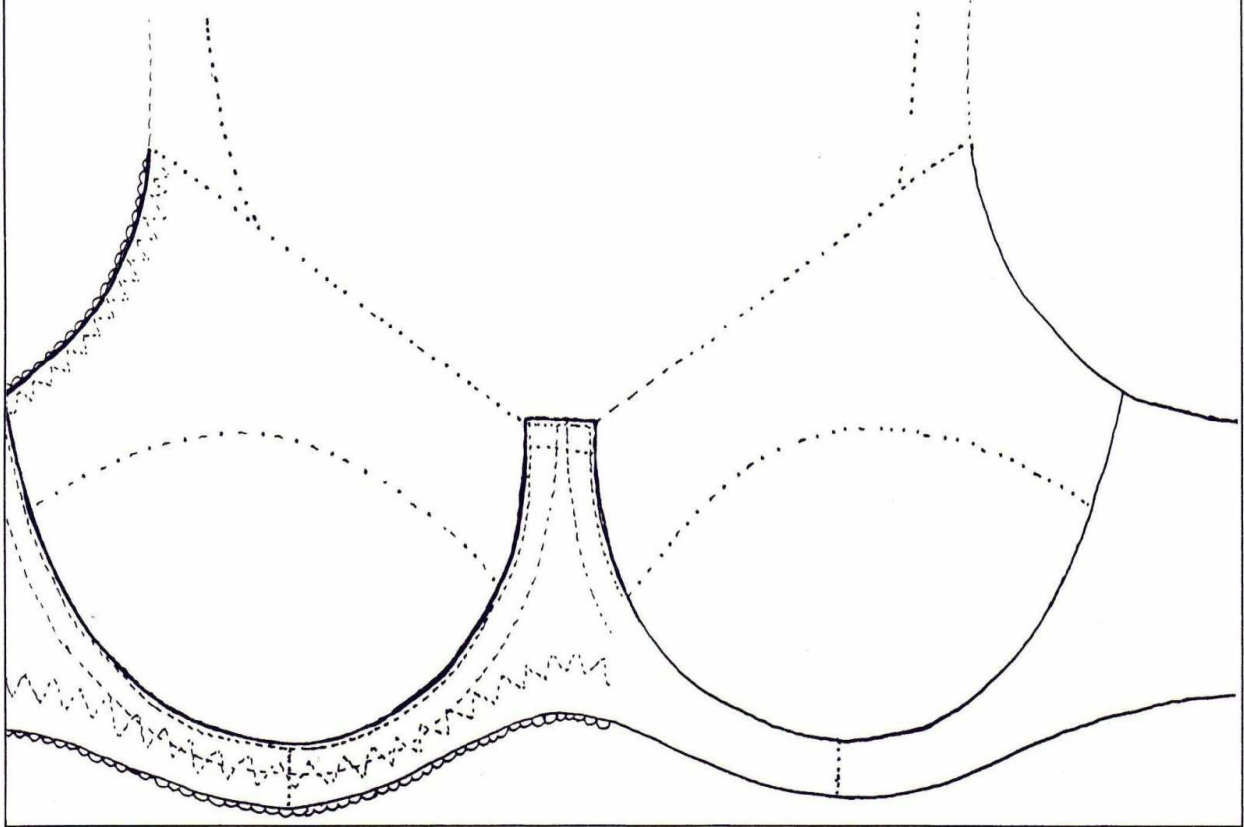


### **STEP 2: LABEL THE VARIOUS PARTS OF THE BRA**

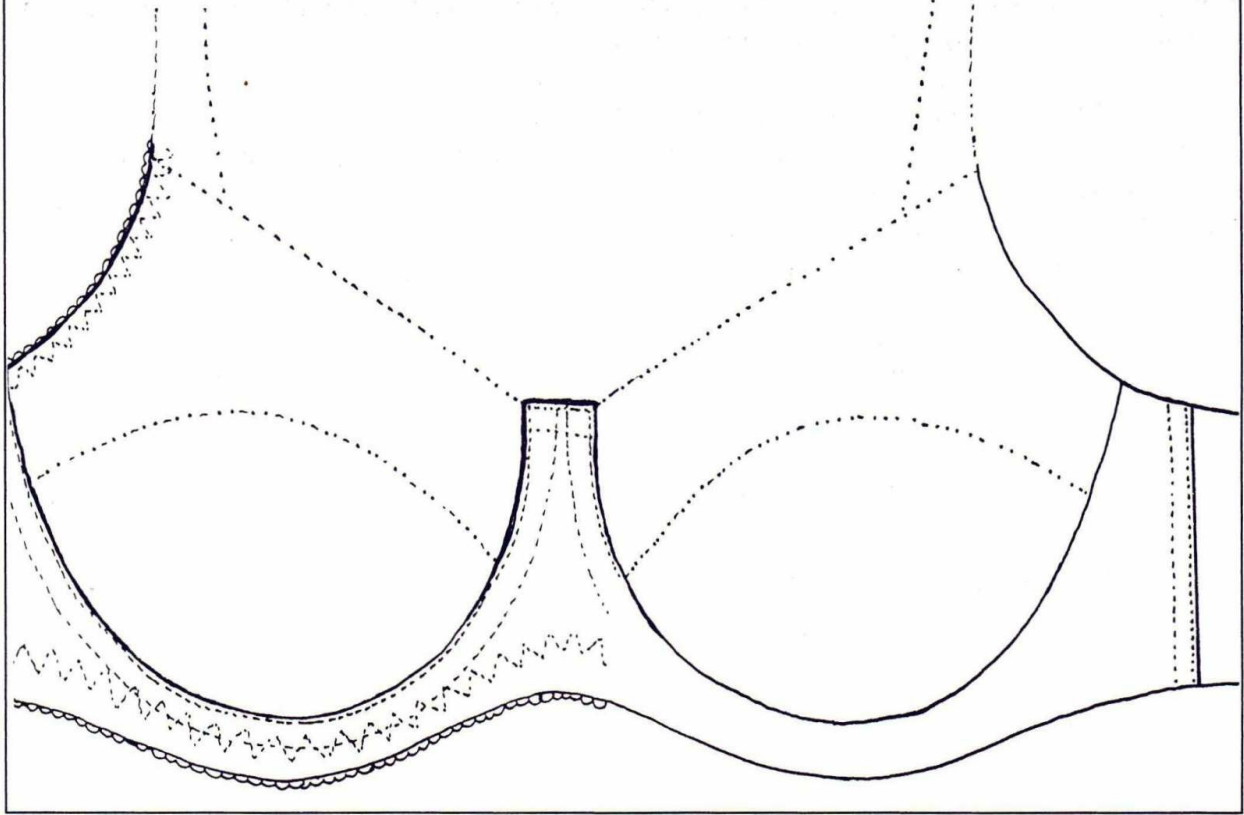
Again, using a felt-tipped pen, label each section of the bra with large capital letters: A, B, C, D, E, F etc.

### **STEP 3: SKETCH THE DESIGN OF THE BRA**

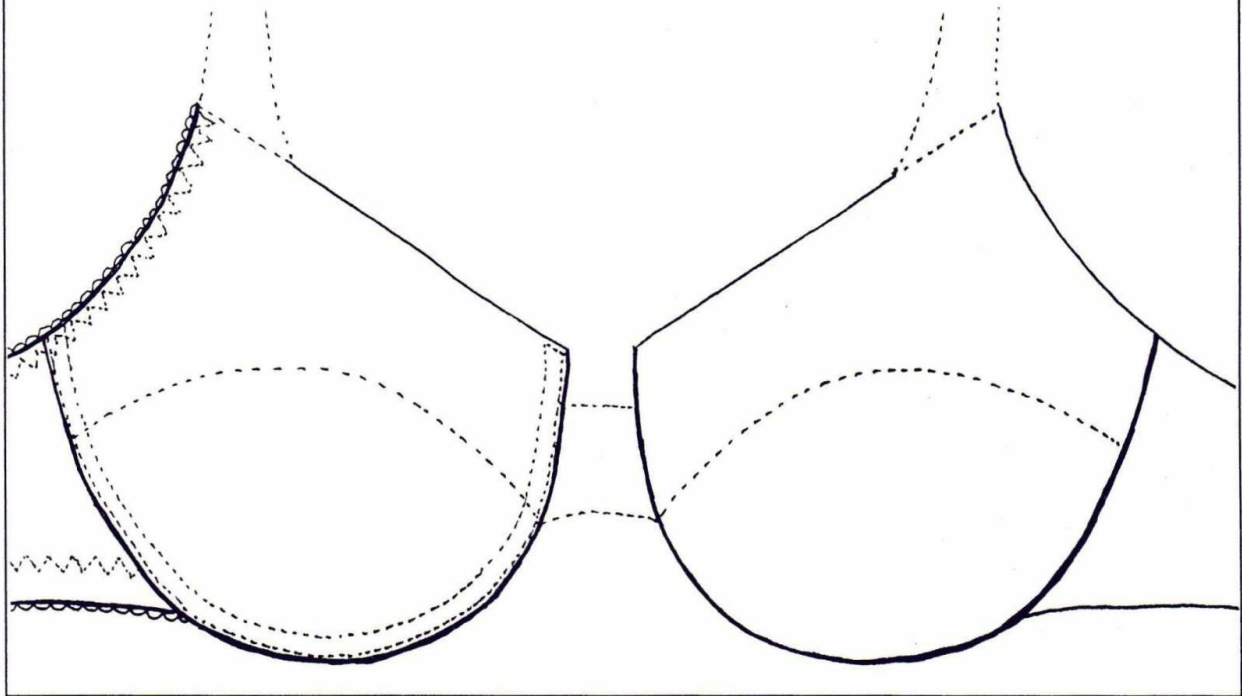
3a. THE Y CENTREPIECE UNDERWIRED BRA



**3b. THE EXTENDED CENTREPIECE UNDERWIRED BRA**



### 3c. THE SMALL CENTREPIECE UNDERWIRED BRA



In your drawing, the cup on the left is later to have all the lines of top stitching and pin-stitching etc. drawn onto it. The cup on your right is to have all the sections of the bra labelled, with the seam lines/edges to be hemmed and colour-coded.

Before using one of these templates, you may wish to **print/copy the template** you will be using (visit [www.beautifulbras.com.au](http://www.beautifulbras.com.au) for downloadable versions of the templates), so that the original template will be available for future use. When using the template, neatly draw the seam lines and edges of your bra, and if they differ from the lines in the template, use liquid paper/correction fluid to delete the superfluous lines. Using a small-medium sized capital letter, positioned approximately in the middle of each section of your diagram, **label each section of your bra** (as in step 2).

Note: A fine, strong, flexible, non-stretch, semi-transparent pattern making fabric such as 'Do-Sew' is ideal for drafting bra patterns, however if it is not available, use the most transparent interfacing you can purchase. Only use tracing paper if you must, because it is prone to tearing.

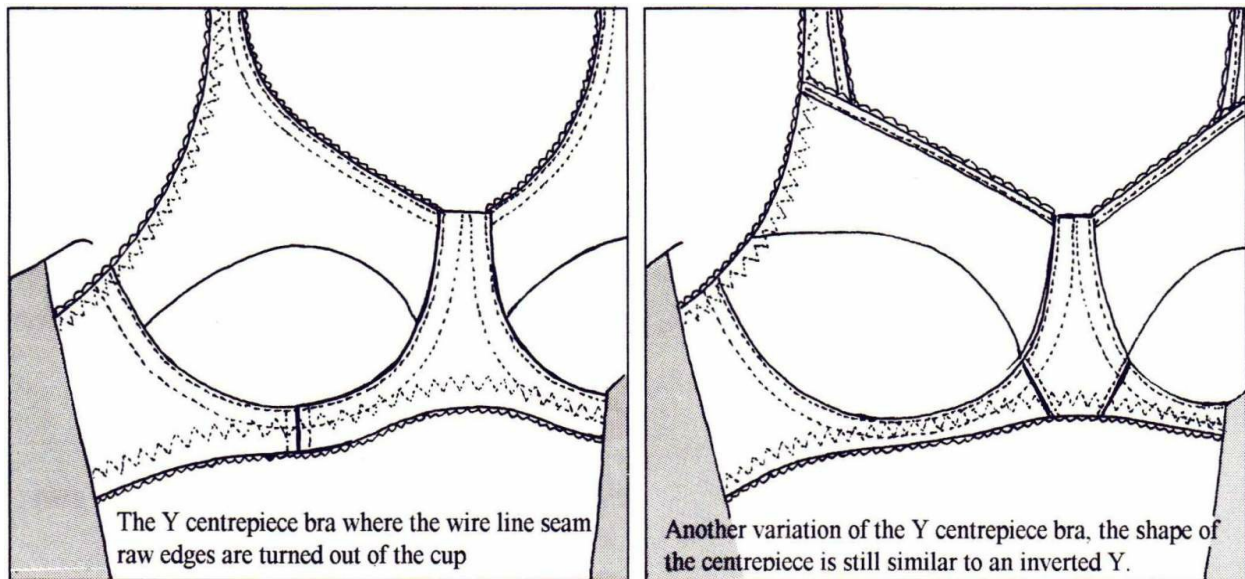


## ***Drafting the Pattern of the Centrepiece***

### **STEP 4: DRAFT THE PATTERN OF THE CENTREPIECE**

In this step, one half of the centerpiece will be carefully traced (whilst stretching the cups apart). The tracing will be unpinned from the bra and its drawing will be refined. Folding the pattern along the centre front fold line and tracing the drawn shape so that the total shape is symmetrical will produce the other half of the centerpiece. Select your set of instructions according to the type of centerpiece in your bra's design.

#### **DRAFTING THE Y CENTREPIECE**



- Using a very fine felt-tipped pen, ***draw the centre front fold line of the centerpiece onto the bra itself***
- ***Pin a piece of 'do-sew'*** (or semi-transparent pattern making-fabric/tracing paper) ***to the centerpiece fabric, inserting the pins vertically along the centre front fold line*** that you drew onto the centerpiece itself.
- ***Stretch the cups apart*** so that the centerpiece fabric is fully extended/lying flat. Stretching the cups apart like this will ensure that the do-sew/tracing paper lies flat on the surface of the centerpiece fabric in between the cups (otherwise it might dip

inwards/pucker along the centre front fold line).

***Pin the pattern making fabric/tracing paper to the bra, inserting your pins on top of the left breast cup's underwire, and at right angles to it*** (pinning along the wire from the centre front down to the small vertical seam under the cup that joins the centrepiece to the bra back). While keeping the cups slightly stretched apart (using your forearm and elbows to anchor the bra to the table surface) and using a single, confidently-drawn line:

***Trace the very top edge of the centrepiece*** (from where the left breast cup meets the centrepiece, across to the centre front fold line),

***Trace the wire line seam*** (where the centerpiece fabric joins onto the left breast cup fabric ... i.e. the cup that lies on your right),

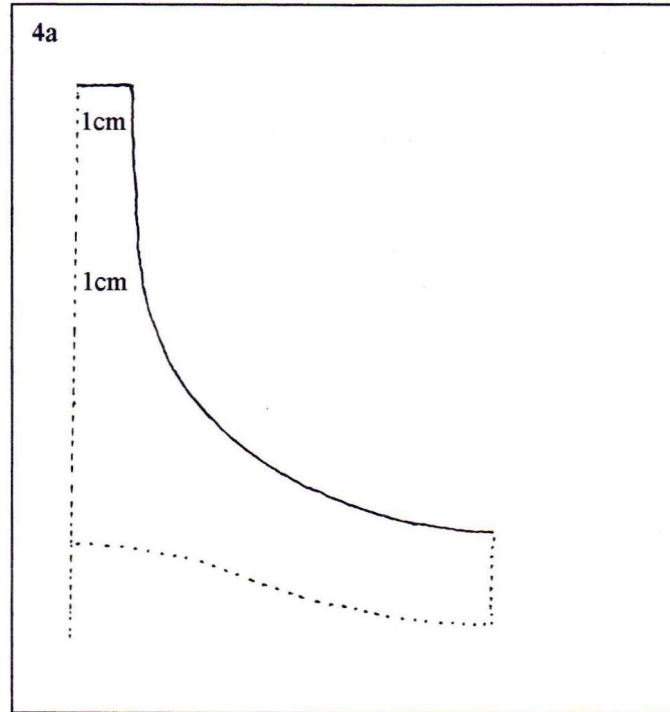
***Trace the seam that joins the centrepiece to the bra back***, (the small vertical seam under the cup)

***Lightly trace the centre front fold line*** (use a line of dots)

***Lightly trace the inner edge of the centrepiece*** (from the bottom of the seam that joins the centrepiece to the bra back, across to the centre front line ... again, use a line of dots) This lower edge is only going to be the approximate position of the edge, as its true position will be determined by the width of the lower edge elastic that will be used when the bra is sewn.

[page 13]

- Remove the tracing from the bra and rule the 4a centre front fold line. The shape that you have drawn will look something like that in diagram 4a. Ensure that the width across the top, from the seam line to the centre front fold line is at least 1cm, and that at no point is the central upright part of the shape, less than 1cm wide. If necessary, correct the drawing of the wire line seam so that this width is exactly 1cm. This minimum width is necessary to comfortably allow the underwire casing from both cups to sit neatly side-by-side in between the cups, in the completed garment.

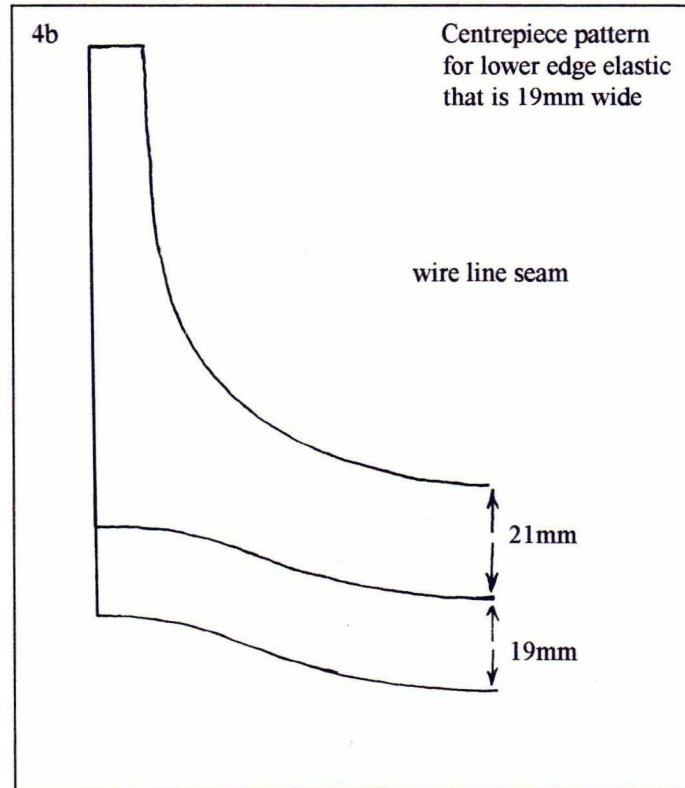


- **Measure the width of the lower edge scalloped elastic** that will be used when the bra is sewn. The width of this elastic will determine the depth of the centrepiece/the band that goes under the cups. **There has to be enough room under the cup for this elastic**, so the finished lower edge of the centrepiece has to be: [the width of the elastic plus 2mm] below the wire line seam (the seam line that joins the centrepiece to the cup). So, to summarise:

***The depth of the band under each cup is [the width of the elastic plus 2mm].***

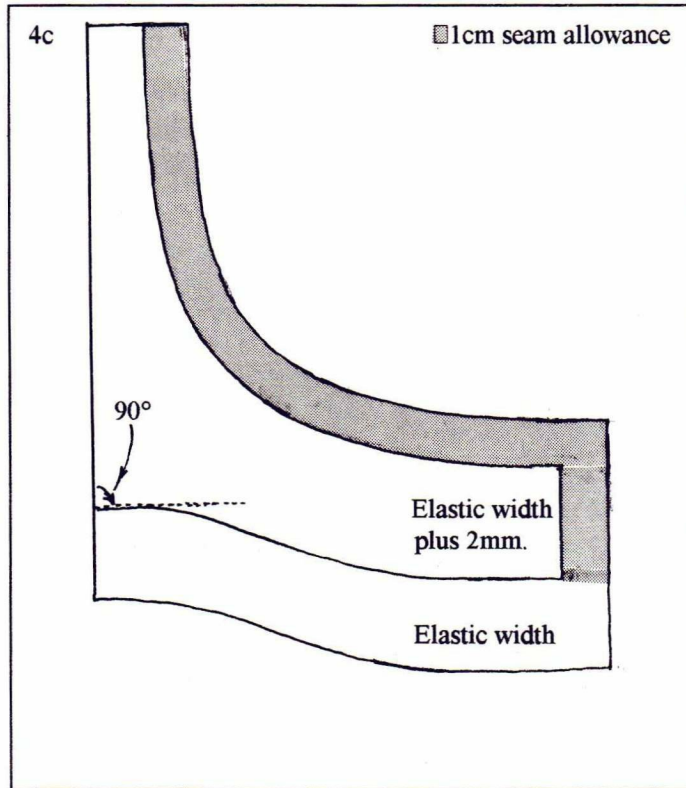
***The depth of the seam allowance along the bottom edge of the bra is the width of the lower edge elastic.***

So if the lower edge elastic to be used is 19mm wide, then the finished depth of the centrepiece, or band under the cup will be 21 mm (a little over 2cm) and the seam allowance on the bottom of this pattern piece will be 19mm wide. This example is illustrated in diagram 4b.



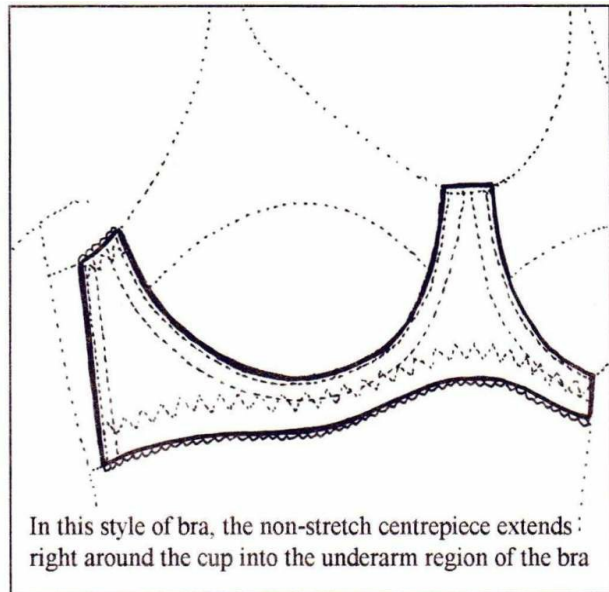
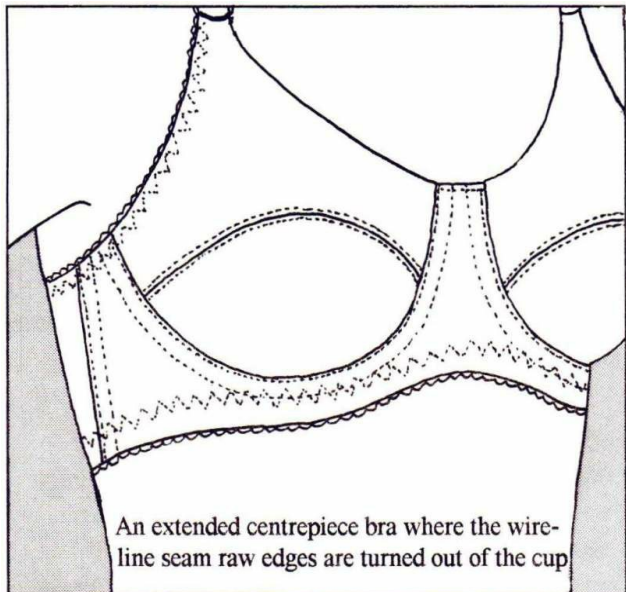
[page 14]

- Using the above information, ***draw the lower edge of the centrepiece, slightly tapering it upwards as it approaches the centre front fold line so that it meets the centre front fold line at a right angle.***
- ***Draw the lower edge seam allowance the width of the lower edge elastic to be used.***
- ***Add an 1cm seam allowance to these other edges of the shape:***  
around the wire line seam, and to the short vertical seam line under the cup space (don't add a seam allowance to the centre line or to the top of the centrepiece. The top of the centrepiece is to be reinforced/bound with tape). Diagram 4c.



- Fold the pattern making fabric/tracing paper along the ruled centre front fold line and **trace the other half of the centrepiece** so that its full shape is drawn.

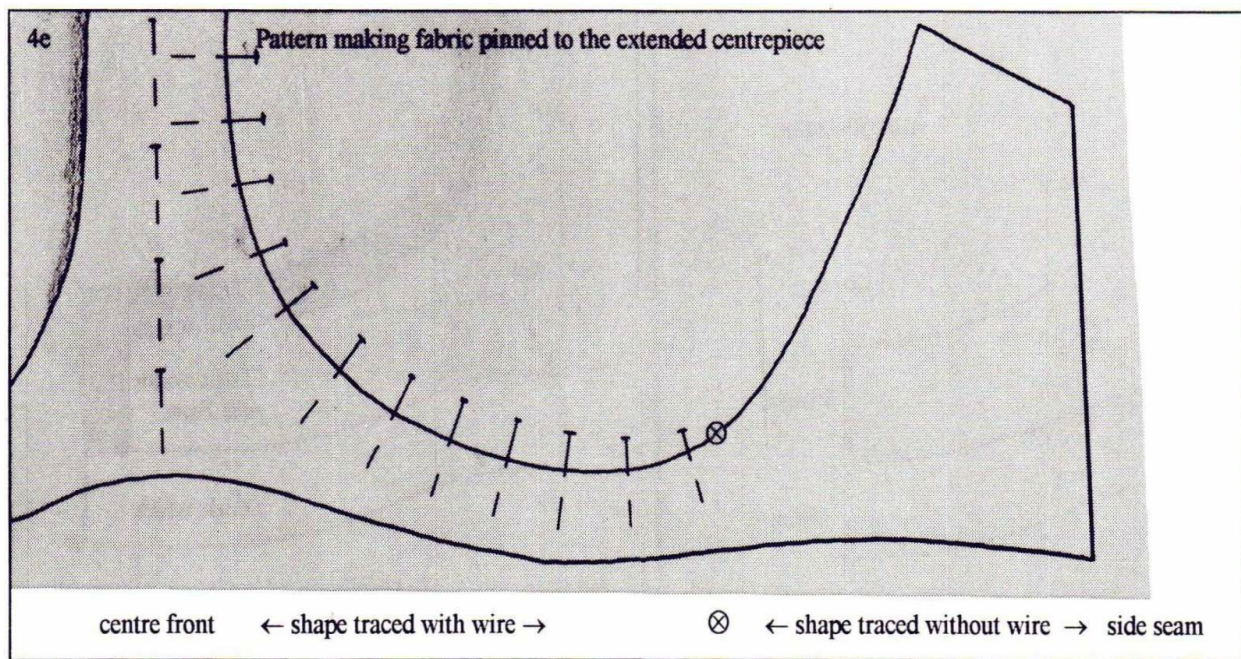
### DRAFTING THE EXTENDED CENTRPIECE



- Using a fine felt-tipped pen, **draw the centre front fold line of the**



**centrepiece onto the bra itself and mark a point on the centrepiece fabric** (where it meets the wire line seam) **approximately two thirds of the way around the wire line seam** the ⊗ in diagram 4e. The shape of the extended centrepiece from ⊗ to the centre front will be traced with the underwire in the bra, and its shape from ⊗ to the side seam will be traced with the underwire removed from the bra.



[page 15]

- **Pin a piece of 'do-sew'** (or semi-transparent pattern making-fabric/tracing paper) **to the centrepiece fabric, inserting the pins along the centre front fold line** that you drew onto the centrepiece itself. Ensure that the pattern making fabric generously covers that half of the extended centrepiece that goes around the left breast cup (the cup to your right). Diagram 4e.
- **Stretch the cups apart** so that the centrepiece fabric is fully extended/lying flat. Stretching the cups apart like this will ensure that the do-sew/tracing fabric lies flat on the surface of the centrepiece fabric in between the cups (otherwise it might dip inwards/pucker along the centre front fold line).  
**Pin the pattern making fabric/tracing paper to the bra, inserting your pins on top of the left breast cup's underwire, and at right**



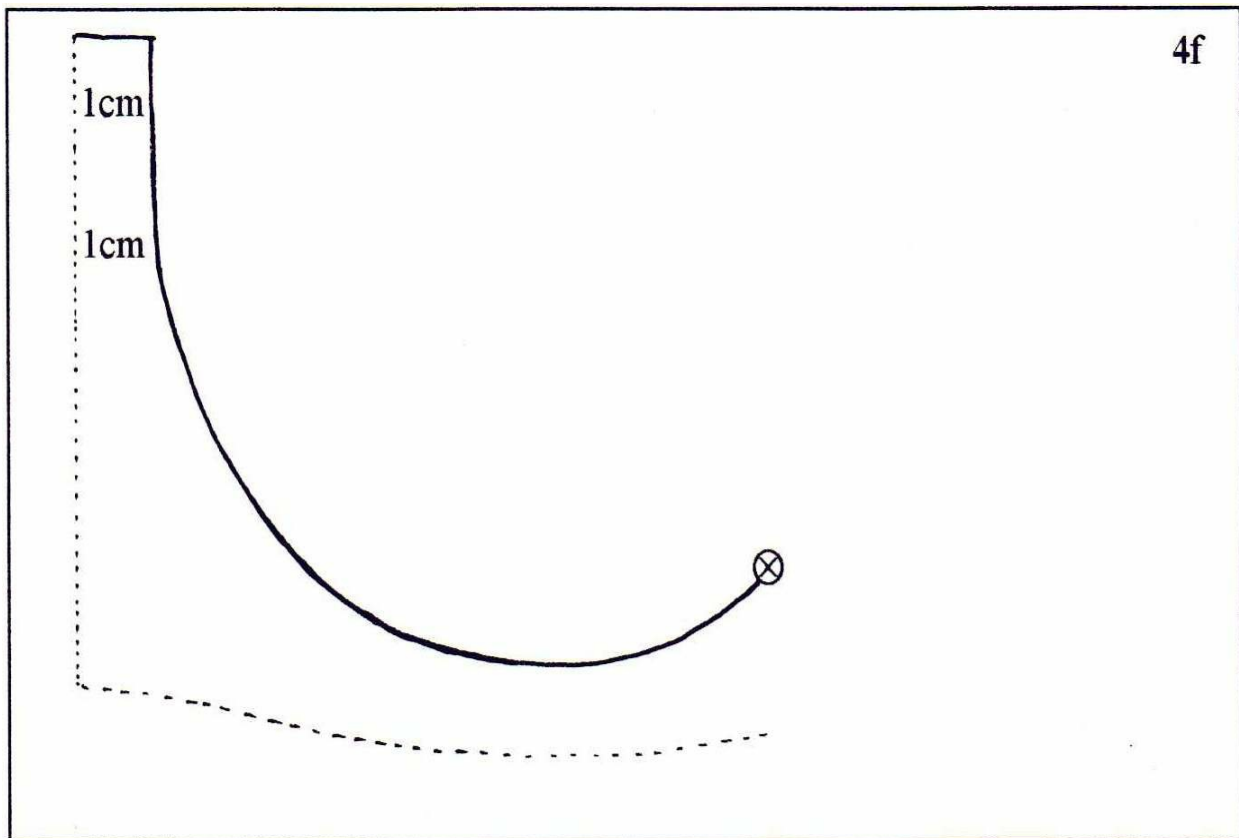
**angles to it** (pinning along the underwire from the centre front down to ⊗ ) Diagram 4e. While keeping the cups slightly stretched apart (using your forearm and elbows to anchor the bra to the table surface) and using a single, confidently-drawn line:

**Trace the very top edge of the centrepiece that lies in between the cups** (from where the left breast cup meets the centrepiece, across to the centre front fold line),

**Trace the wire line seam down to ⊗** (the wire line seam is where the centrepiece fabric joins onto the left breast cup's fabric).

**Lightly trace the centre front fold line** (use a line of dots)

**Lightly trace the lower edge of the centrepiece** (from directly beneath ⊗ across to the centre front fold line.. . again, use a line of dots. This lower edge line is only going to be the approximate position of the edge, as its true position will be determined by the width of the lower edge scalloped elastic that will be used when the bra is sewn.

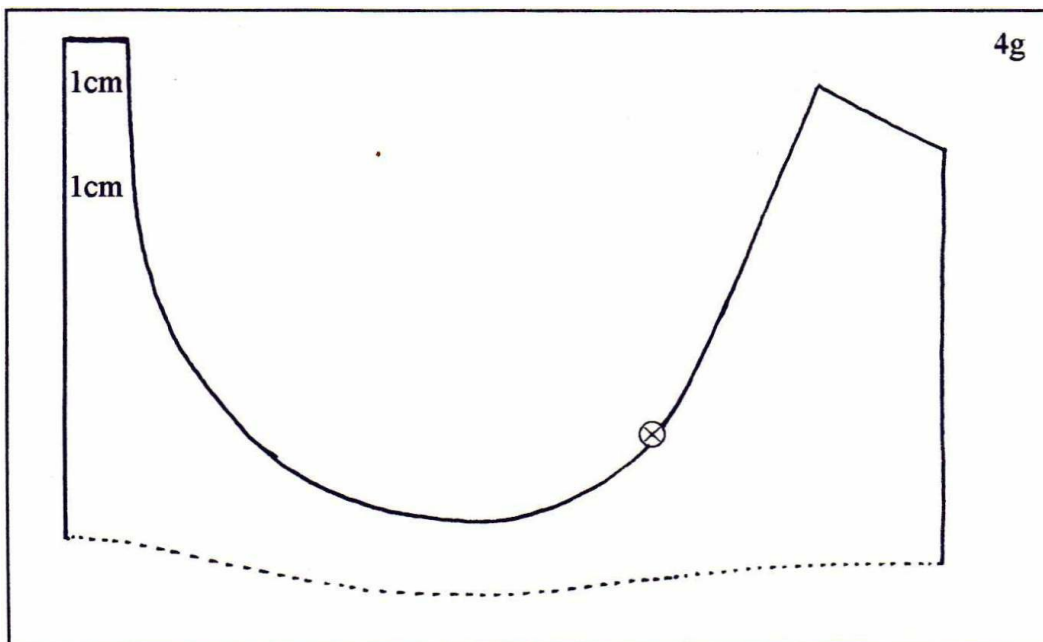


- **Remove the left breast cup's underwire and in the area between**

***the underwire and the side seam, cut through both the upper and lower edge elastic at close intervals.*** Cutting through the elastic like this will allow the side area of the centrepiece fabric to relax.

- ***Re-pin the drawing to the bra***, inserting your pins across the wire line seam as before. Insert a pin through the ⊗ symbol and the point at which you stopped drawing the wire line seam.
- ***Trace the remainder of the wire line seam***,  
***Trace the upper side edge of the centrepiece*** (from the wire line seam to the side seam),  
***Trace the side seam*** (that joins the centrepiece to the bra back), and  
***Lightly trace the remainder of the lower edge of the centrepiece***, from the bottom of the side seam back to underneath the ⊗ symbol. Diagram 4g shows these steps completed.

[page 16]

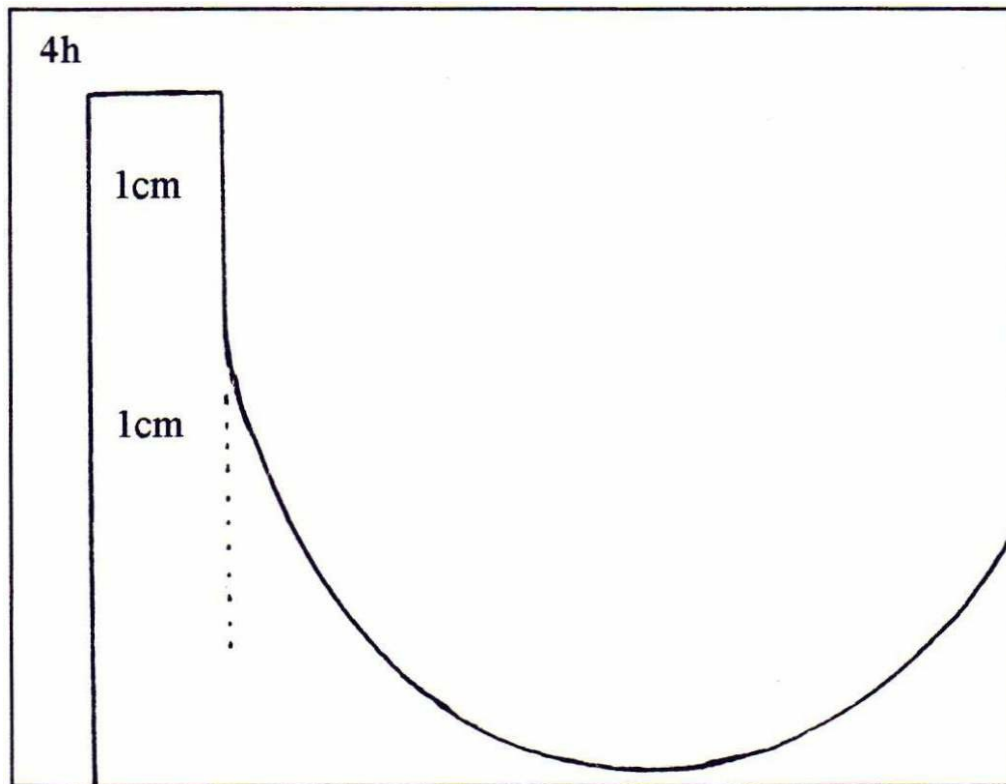


- ***Remove the tracing from the bra and rule the 4h centre front fold line.***

Ensure that the width across the top, from the seam line to the centre front fold line is at least 1cm, and that at no point is the central upright part of the shape, less than 1cm wide.

If necessary, correct the drawing of the wire line seam so that this

width is exactly 1cm. This minimum width is necessary to comfortably allow the underwire casing from both cups to sit neatly side-by-side in between the cups, in the completed garment.



- **Measure the width of the lower edge scalloped elastic** that will be used when the bra is sewn.

The width of this elastic will determine the depth of the centrepiece/the band that goes under the cups.

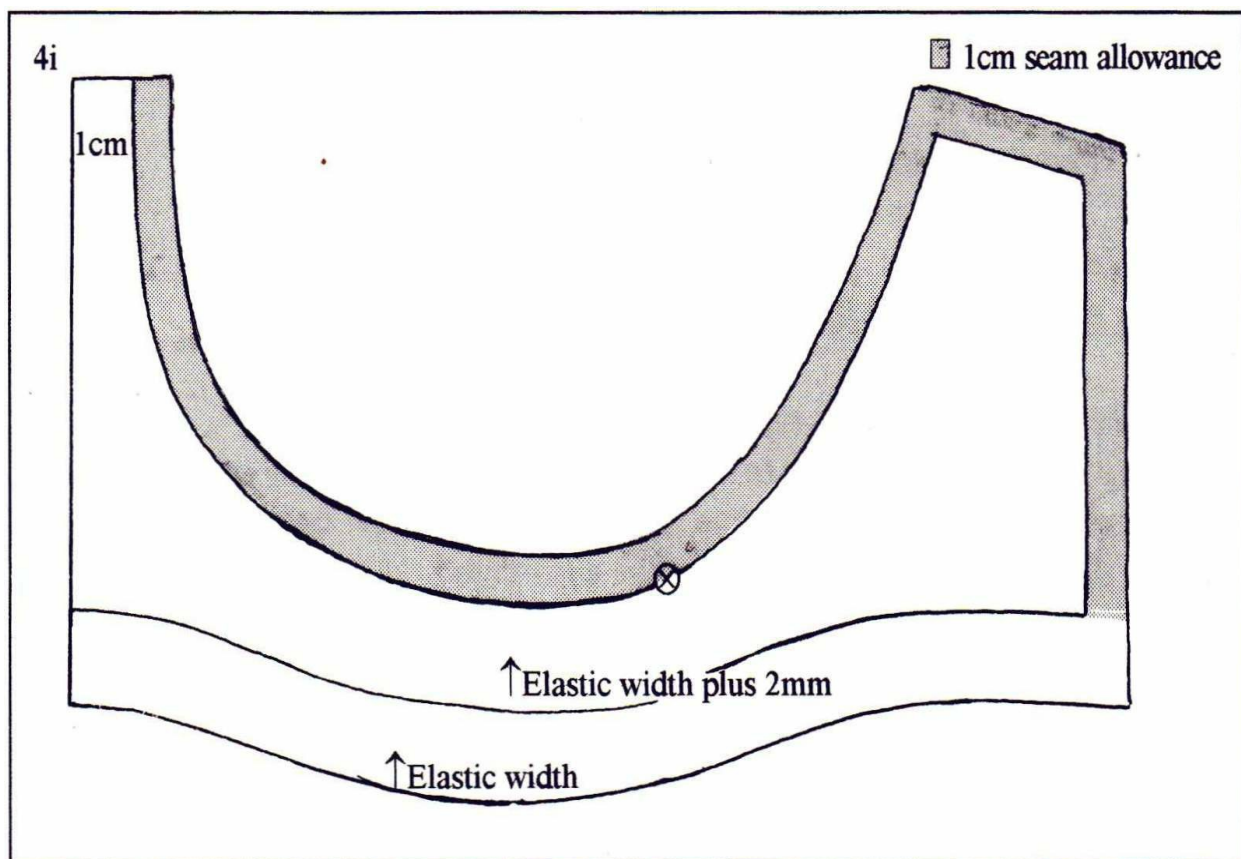
***There has to be enough room under the cup for this elastic*** so the lower edge of the centrepiece has to be: [the width of the elastic plus 2mm] below the wire line seam (the seam line that joins the centrepiece to the cup).

***The depth of the band under each cup is [the width of the elastic plus 2mm]***

***The depth of the seam allowance along the bottom edge of the bra is the exact width of the lower edge elastic.*** So, if the lower edge elastic to be used is 19mm wide, then the finished depth of the centrepiece, or band under the cup will be 21mm (a little over 2cm) and the seam allowance will be 19mm wide.

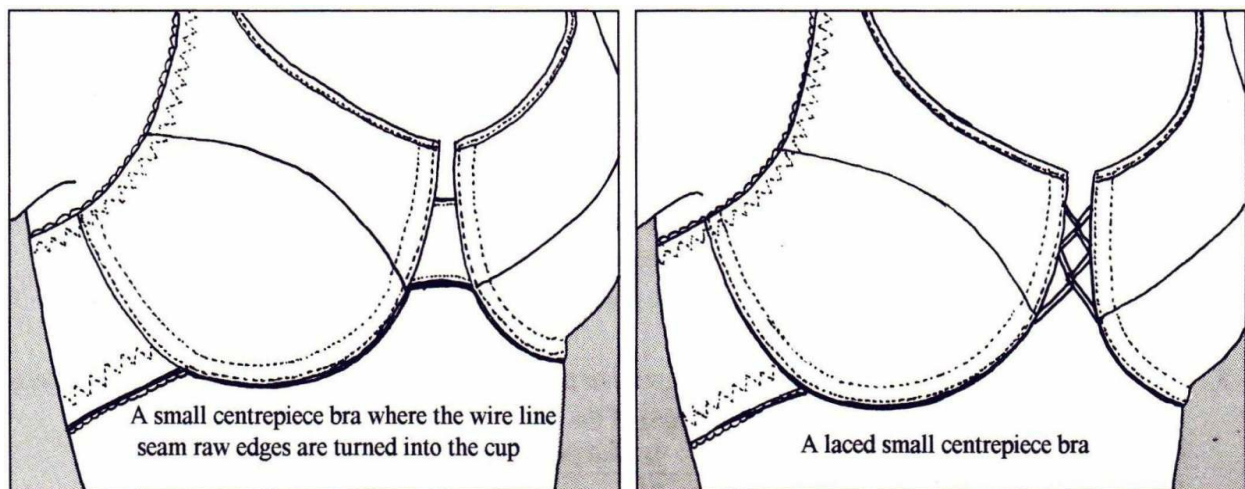
- Using the above information, **draw the lower edge of the centrepiece, slightly tapering it upwards as it approaches the centre front fold line so that it meets the centre front fold line at a right angle.** If the elastic to be used is wider than the elastic used in your pattern bra, the whole lower edge that you are now drawing will be slightly below the dotted line that was previously drawn. Accordingly, the side seam will be slightly longer, and the bra back will be slightly deeper.
- **Draw the lower edge seam allowance the width of the lower edge elastic to be used.**
- **Add an 1cm seam allowance to the other edges of the shape:** to the wire line seam and to the side seam (do not add a seam allowance to the centre front Ad line or the top edge of the centrepiece. The top edge of the centrepiece will later be reinforced or bound with narrow tape). Diagram 4i.

[page 17]



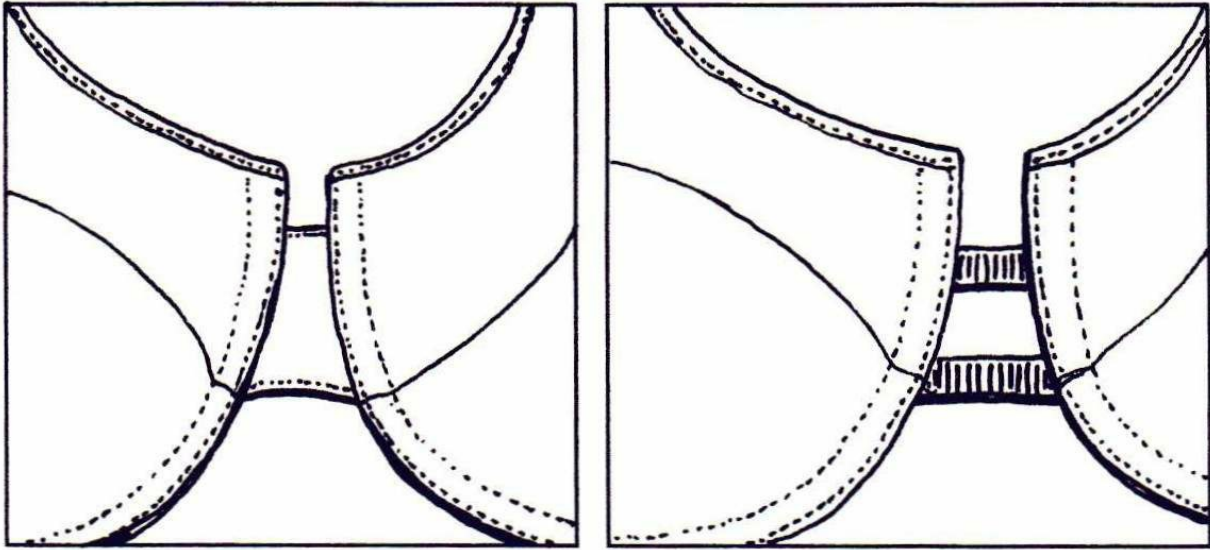
Should you wish to cut the centrepiece out whole (instead of positioning it on a fold in your fabric), you might like to trace the centrepiece onto the a much wider piece of pattern making fabric, fold the pattern making fabric/tracing paper in half along the ruled centre front fold line, and **trace the other half of the centrepiece** so that its total shape is fully drawn. When designing extended centrepiece bras, in order to economise on their use of fabric, bra manufacturers often create a **centre front seam** in the centrepiece instead of having a centre front fold line. If you wish to create a centre front seam line, simply add a 1cm seam allowance to the centre front line on your pattern. In some instances there is also an additional, superfluous seam in the centrepiece directly under each cup. Again, this is done to save on fabric.

### ***DRAFTING THE SMALL CENTREPIECE***



The centrepiece style that consists of interlaced spaghetti straps is particularly poor as the narrow straps break, due to their continual rubbing against each other. A solid piece of fabric as a centrepiece is much stronger. Alternatively, two pieces of reinforced (non-stretch) strap elastic that cover the same area as the solid piece of fabric could be used.

The pattern of the small centrepiece is the easiest of all to draft, as it is a simple shape with a 1cm seam allowance all the way around it.



[page 18]

- Using a fine, felt tipped marker, draw the centre front fold line onto the centrepiece.
- ***Pin a piece of 'do-sew'*** (or semi-transparent pattern making-fabric/tracing paper) ***to the centrepiece fabric, inserting the pins along the centre front fold line*** that you drew onto the centrepiece.
- ***Stretch the cups apart*** so that the centrepiece fabric is fully extended/lying flat.

***Further pin the pattern making fabric/tracing paper to the bra***, by inserting pins on top of the left breast cup's underwire, and at right angles to it (pinning along the seam line that joins the centrepiece to the left breast cup ... this will only be a short distance). While keeping the cups slightly stretched apart (using your forearm and elbows to anchor the bra to the table surface) and using a single, confidently-drawn line:

***Trace the very top edge of the centrepiece that lies in between the cups*** (from where the left breast cup meets the centrepiece, across to the centre front fold line),

***Trace the wire line seam*** from where the top edge of the centrepiece meets the left breast cup down to where the lower edge of the centrepiece joins onto the left breast cup. (the wire line seam is where the centrepiece fabric joins onto the left breast cup's fabric).



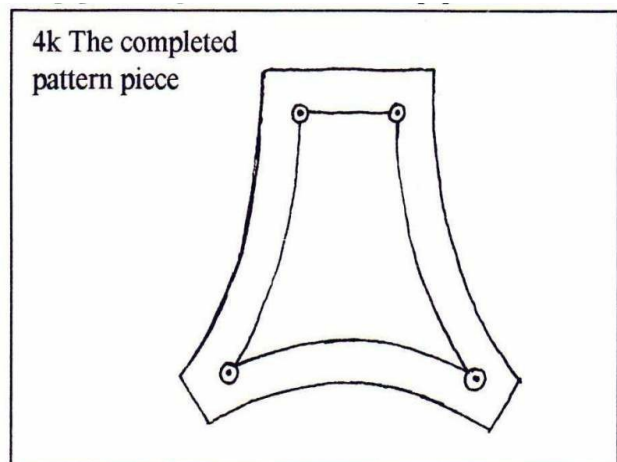
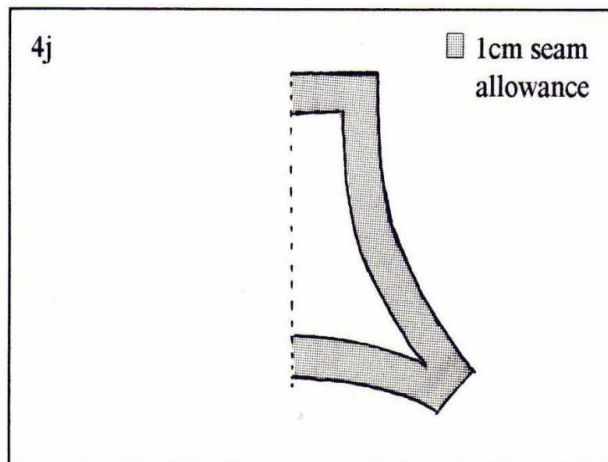
**Lightly trace the centre front fold line** (use a line of dots)

**Trace the lower edge of the centrepiece** (across to the centre front fold line).

- **Remove the tracing from the bra and rule the centre front fold line.**
- **Add an exact 1cm seam allowance to all the edges** (not to the centre front fold line of course). If the lower edge of the centrepiece meets the wire line seam at a sharp angle, bevel the tip of the seam allowance so that the beveled edge of the seam allowance is 1cm from the point where the two meet. Diagram 4j.
- Fold the centrepiece along the centre front fold line and trace the other half of the centrepiece so that its full shape is drawn.
- If your centrepiece is of the interlaced spaghetti strap variety, then to draft its pattern,  
**pin the pattern making fabric to one of the wire line seams,**  
**stretch the cups apart,**  
**draw the whole shape of the area covered by the lacing** and  
**add a 1cm seam allowance around the whole shape** to complete your pattern.

Doing this will give you the fill shape, which may not be exactly symmetrical.

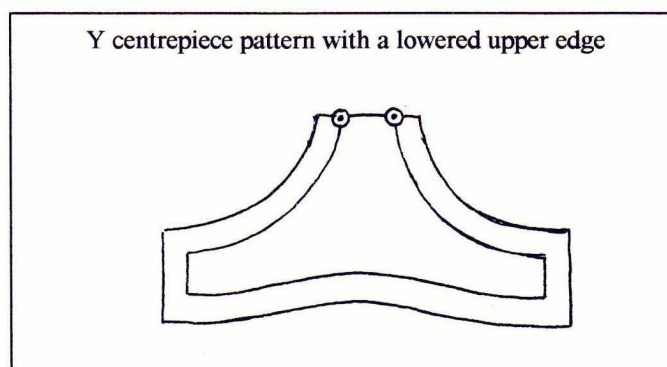
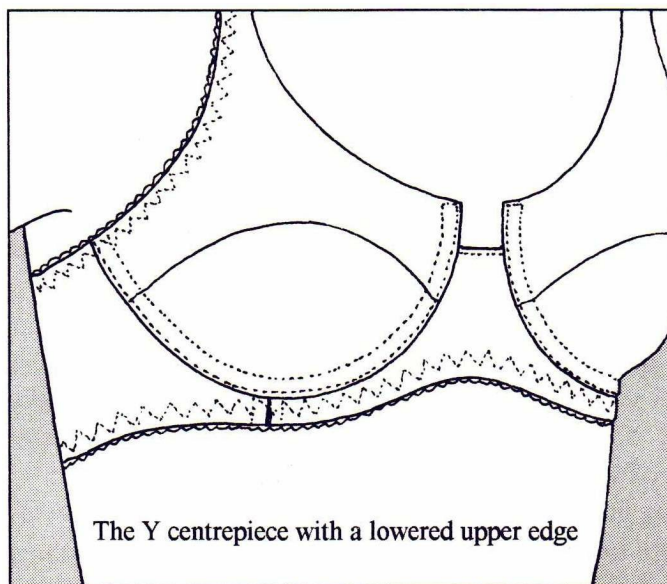
- Once the centrepiece pattern is drafted, **clearly mark the alignment points** onto it ... these are the points at which the upper and lower edges of the centrepiece join to the cups. Diagram 4k. Note: these points should also be marked onto the cup pattern pieces when the cup pattern is drafted.

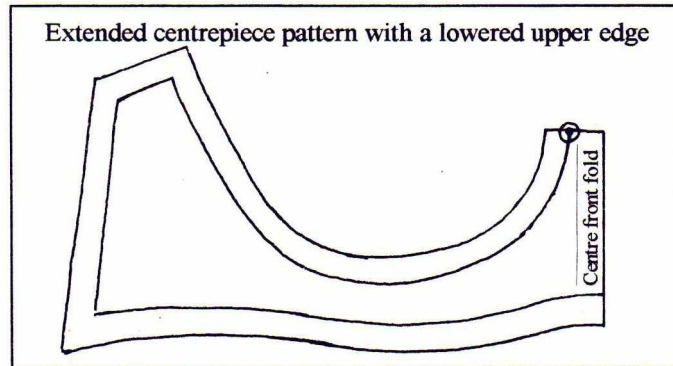
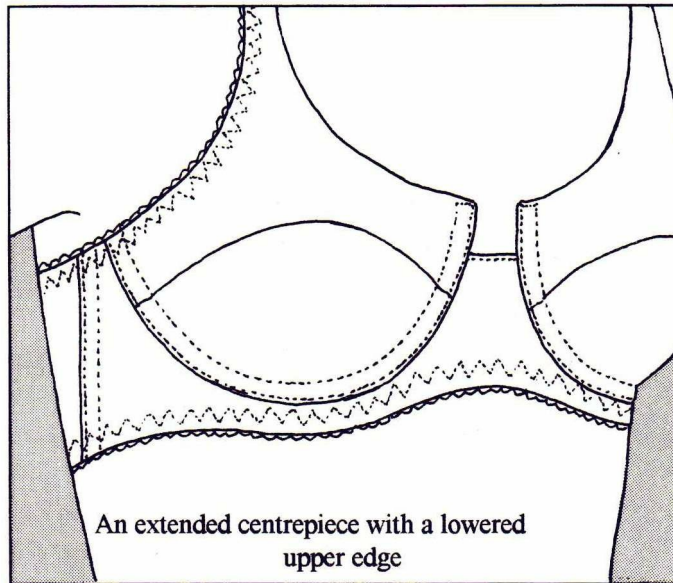


The three common styles of underwired bras are defined by their centrepiece type: they are either a Y centrepiece bra, an extended centrepiece bra, or a small centrepiece bra. Front-opening, underwired bras are simply a variation of one of these styles ... with a front closure, instead of a centre front fold or seam line. There is one other style of underwired bra. It is either a Y centrepiece or an extended centrepiece bra, that has the centre ***front upper edge of its centrepiece lowered to produce a U-shaped space in between the cups***. Because the wire line seams on each cup are exposed above the top edge of the centrepiece, all the wire line seam raw edges must be turned into the cup to be top stitched down, making this style a combination of a small centrepiece bra and either the Y centrepiece or an extended centrepiece style.

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### ***DRAFTING THE U-SHAPED SPACE CENTREPIECE***





When drafting the pattern of either of these centrepieces, follow the instructions for either the Y centrepiece or the extended centrepiece style. The instructions are identical. Because of the lowered upper edge, the shape of the centrepiece pattern will not be so high, and the alignment points (where the upper edge of the centrepiece joins to the cups) should be clearly marked on both the centrepiece pattern and the cup pattern pieces.

The centrepiece you have drafted, is the heart of the bra. It needs to be strong as well as non-bulky and should be made out of a non-stretch (preferably bonded), lace or knit fabric. A strong knit fabric is far preferable to a woven fabric. The tendency to fray and tear makes woven fabrics inferior to knit fabrics in bra making. If a pre-bonded lace or pre-bonded fabric is not available, it is a simple matter of making your own, by fusing rigid stabiliser to the back of a lace or fine knit fabric (e.g. nylon tricot). Rigid stabiliser is the non-stretch nylon knit that is used in the manufacture of

men's trouser pockets. ***Regardless of the style of your centrepiece, its top edge (in between the cup spaces) can either be hemmed (which will require a seam allowance along the edge, the width of which will be determined by the width of the hem) or reinforced/bound with narrow tape (no seam allowance is required).***

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## Drafting the Pattern of the Bra Back

### **USE YOUR BRA BACK TO EXTEND THE GARMENT LIFE OF YOUR BRAS**

If you are perfectly happy with the style and quality of bra back in your manufactured bra, simply ***clone the bra back***, using the same pattern as well as the same type of fabric/lace in its construction.

Many women find that the part of their bras that fatigues most quickly is the bra back. A weak bra back significantly shortens the garment life of a bra. Often the bra cups are in relatively good condition, but the bra back is hopelessly stretched, rendering the bra useless. ***This happens because the stretch fabric of the bra back is stretching to its absolute maximum every time we wear the bra.*** Any stretch fabric, continually stretched to its maximum extent, will fatigue and become over-stretched fairly quickly. ***The aim is to produce a stronger bra back that will still exert significant horizontal tension on the cup without having to stretch to its maximum every time the bra is worn.***

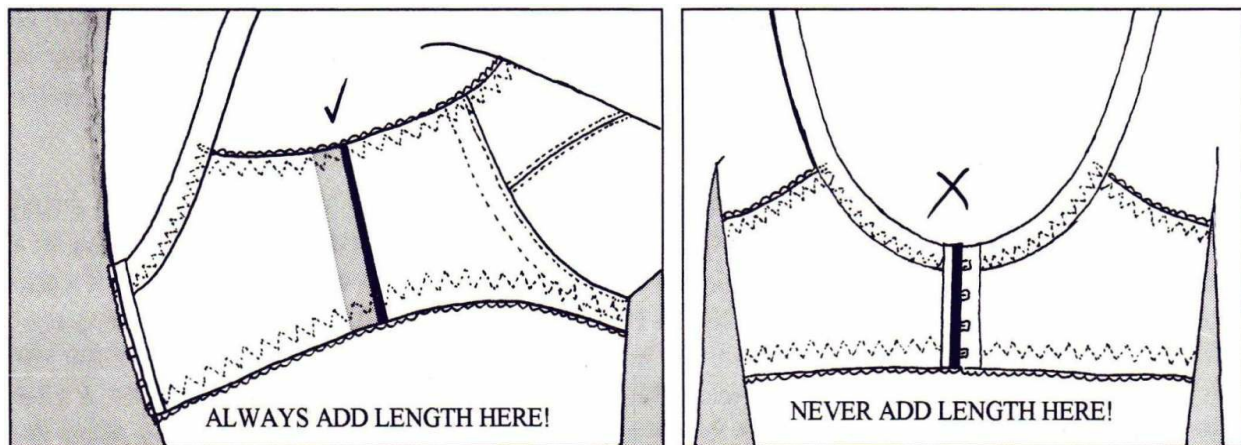
The following three options are available to us (number two is the option I generally recommend). I will deal with the third option last, as it is a technique that is only recommended for use by experienced bra makers.

1. ***A little more strength can be obtained in the bra back by covering the bra back fabric with stretch lace.*** Doing this also makes the bra back more attractive ... utilising both the strength/support that the powernet or spandex gives, as well as the delicate appearance of the stretch lace.

2. ***Greater strength can be obtained in the bra back by making it out of a stronger/heavier-weight (less 'spongy') fabric.*** Both powernet and spandex come in a variety of grades and strengths. When I make expensive, custom-

made bras for my larger-busted clients I make the bra back out of surgical-corset powernet (called Lycra Lenno). Out of all the grades of powernet and spandex, this is the strongest type. Important Note: If your pattern bra was already a snug fit around your ribcage, (even when the closure was done up on the loosest bank of eyes), ***the shape of the bra back pattern piece will have to be lengthened in the underarm region*** so that your new bras (with their stronger bra backs) are not too tight around the ribcage.

***Adding strength to the bra back will involve extending the bra back pattern piece in the underarm region of the garment.*** Extending the bra back pattern piece in the underarm region is necessary to ensure that the bra will still be comfortable around the ribcage when it is worn. The bra back pattern should be extended in length according to the degree to which the bra back section of the bra has been strengthened i.e. the amount of strength that is added to the bra back fabric will determine just how much length should be added to the pattern piece. Note: Never make the bra back longer by mistakenly adding length to the bra back pattern at the centre back closure edge! (Making this mistake will move the back-strap attachment points much too close to the armpits, causing the bra straps to continually fall over the shoulders).

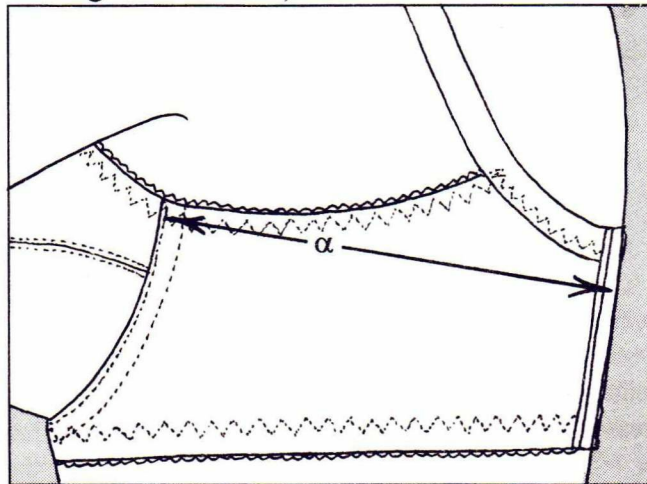


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If covering the bra back fabric with stretch lace according to option 1, the length of the bra back pattern will only need to be slightly extended in the underarm region. Extend it by adding in a 1cm or 2cm wide corridor (as indicated by the shaded area in the diagram above left).

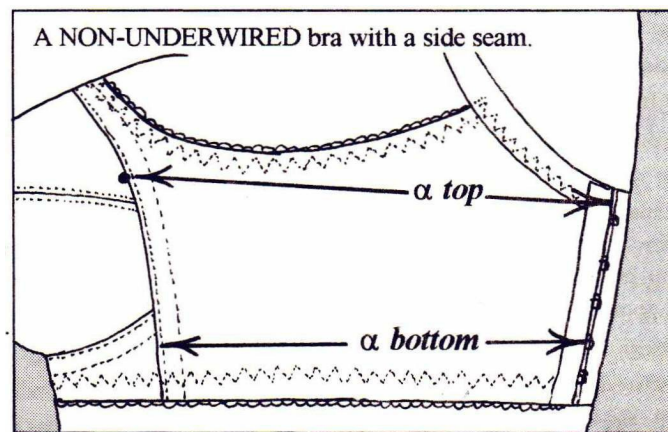
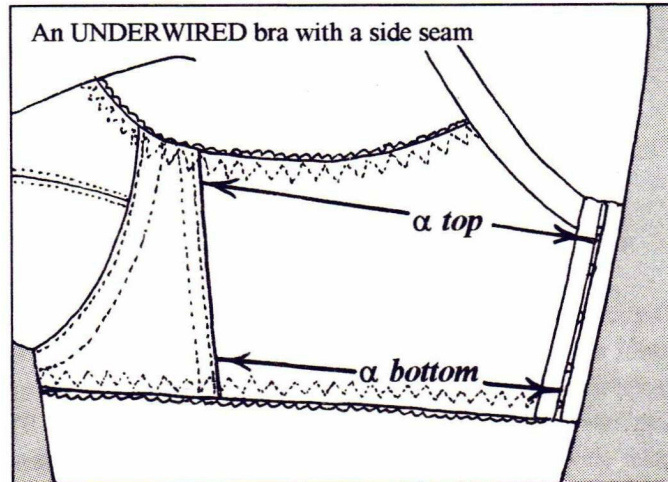


If making your bra back stronger by using options 2 or 3 (following), you will need a friend to take one or two exact measurements **when your bra is being worn**. These measurements are necessary in order to ascertain the horizontal length of the bra back pattern piece: **Measure the horizontal distance from the centre back of your body (the middle of your spine) across to the nearest part of the bra that is made out of non-stretch material**. This measurement is the distance of the frilly stretched bra back (how far the bra back has to stretch on the body to produce a snug bra fit). This measurement is indicated by the  $\alpha$  symbol in the following diagrams. Once the pattern bra's original back pattern piece is drafted, modifications can be made according to this measurement. The measurement that you take will depend on the particular style of your bra, so select the particular style of your bra from one of the following:



- **If your bra style has stretch fabric that extends all the way across from the centre back to the underarm tip of the underwire, measure the horizontal distance from the centre back to the top of the wire line seam (where the cup joins to the top edge of the bra back under the arm)** (measurement  $\alpha$  in the first diagram above). Take a note of this measurement.

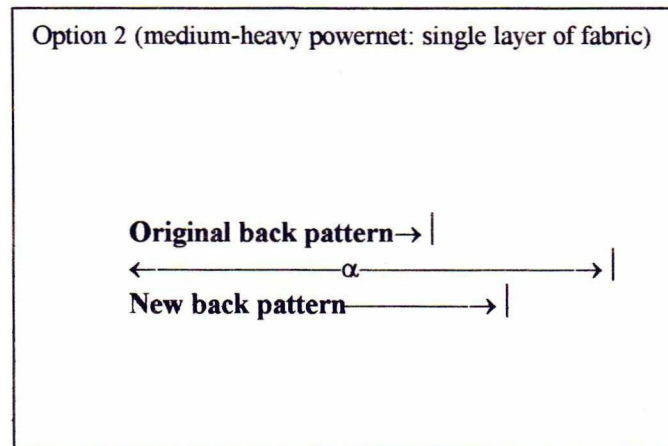




- ***If your bra style has a vertical (or near-vertical) side seam in the underarm region where the stretch fabric of the bra back is joined to the rest of the bra, (this could be in an underwired or non-underwired bra) measure both of the following measurements:***
  - 1. the horizontal distance from the very top of the side seam across to the centre back of the body (to the middle of the spine). This distance is indicated by the  $\alpha_{top}$  measurement in the diagrams above ... and ...***
  - 2. the horizontal distance from the very bottom of the side seam across to the centre back of the body (the middle of the spine). This distance is  $\alpha_{bottom}$  in the diagrams above.***

Once the above measurement(s) have been taken and recorded, the following information will be a guide in extending your bra back pattern by the appropriate amount.

**Option 2.** When strengthening the bra back by using a much heavier quality spandex or powernet, ***the length of the bra back pattern piece should be approximately one-third to half-way between the original pattern's closure edge and the measurement that you have recorded ( $\alpha$ ).***



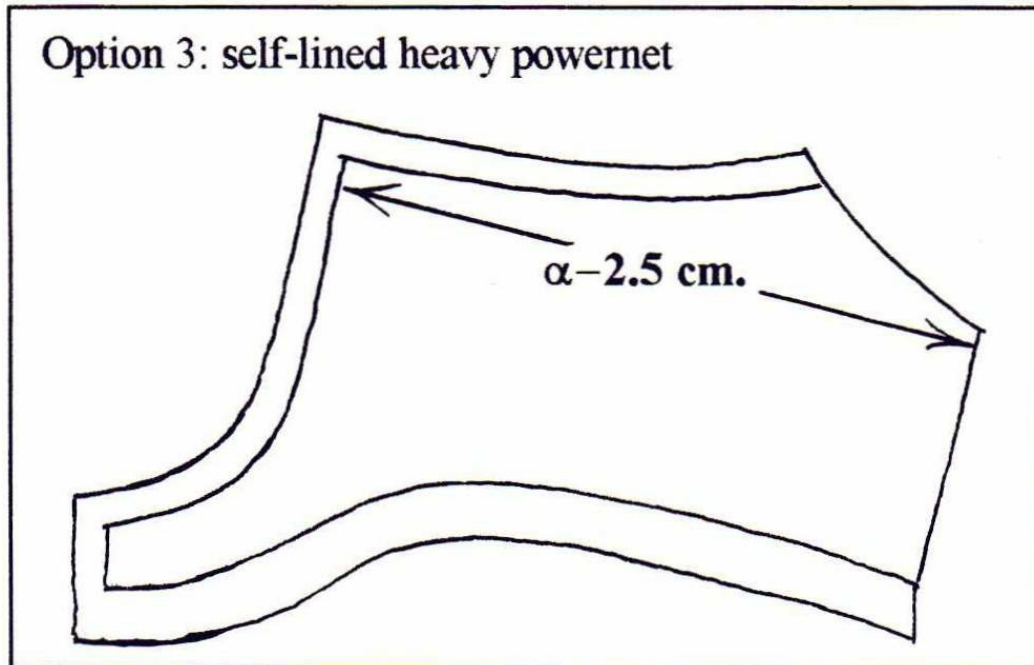
[page 22]

Note that these pattern measurements are only approximate measurements. It is impossible to ascertain this pattern length exactly, as both spandex and powernet come in many different qualities and knit patterns and each one has its own individual stretch qualities. If in doubt, make the bra back a little longer than you think will be necessary, so that when the first bra is almost completed it can be tried on (before the straps are sewn to the bra back and the closure tabs are sewn to the centre back edges). At this stage, any unwanted length in the bra back fabric can be cut off in the centre back area. Refer to [page 64](#) for the appropriate pattern making techniques. It is now time to deal with the third option ... that of self-lining the bra back fabric.

**3. *Maximum strength can be obtained if the bra back is self-lined, using two layers of medium-weight powernet fabric instead of just a single layer.***

The direction of greatest stretch in both layers will naturally go around the body. If self-lining the bra back, the horizontal length of the bra back will need to be significantly extended, because the body has to stretch out two layers of fabric instead of just one single layer. When self-lining a bra back, I prefer to use powernet, as I find that powernet is less bulky than spandex. When drafting the bra back pattern so that the back can be self-lined using

two layers of medium/heavy powernet, ***the length of the back pattern piece from the wire line seam to the centre back closure edge should be approximately:  $\alpha$  minus 2 ½cm***



**Important note:** Self-lining a bra back, while producing bras with a much-extended garment life, is a technique that can itself, create design problems in a bra. Because of this, it is a technique that has to be used with discretion, and is only recommended for confident, experienced bra makers who are willing to experiment. Self-lining a bra back will involve a re-drafting of the shape of the bra back pattern piece. The reason for the re-drafting is as follows. A well-designed bra back should exert an evenly distributed and moderate amount of horizontal tension on side of the cup (splaying the underwire apart in the process). The shape of the bra back in a typical manufactured bra is commonly designed for fabrics containing moderate to high stretch (the spongy fabrics such as lycra and light-medium weight powernet/spandex). These fabrics stretch to their maximum extent when the bra is worn. When self-lining the bra back fabric, the shape of the bra back pattern piece needs to be much longer, as the stretchability of the total bra back has been significantly reduced ... however the bra back pattern piece cannot just be extended this amount in the underarm region, as doing this often produces a bra back that is much too slack along its top underarm

edge. (The reason the original manufactured bra's top underarm edge wasn't slack is because the bra back fabric was stretched to its maximum). Unwanted slackness along the top underarm edge of the bra produces an insufficient amount of horizontal tension on the cup (which may cause unsightly puckering across the cup) and produces a bra back that fails to sufficiently splay the underwire uprights apart. In this instance, because the unsplayed side underwire upright will be sitting on top of breast tissue, the side tip will catch on the inside of the upper arm when the bra is worn. The Important rule therefore, is that self-lining the bra back, great care must be exercised to ensure that the top underarm edge of the bra (from the ring at the top of the cup, right around to the top of the closure tab) is snug-fitting. To ensure that the top underarm edge is a snug fit, refer to the pattern making instructions [page 60](#)

***Self-lining a bra back will also necessitate having a different pattern piece for the bra back lining in order to minimise edge-line bulk, and reducing the seam line bulk by grading the raw edges.***

***When self-lining the bra back, the edge-line bulk will need to be minimised when you construct your bra.*** To reduce edge-line bulk, the inner, lining layer should have its own pattern: a pattern which will be identical to that of the outer layer of the bra back, except that it will have no seam allowance along its top and bottom edges (these seam allowances will be the exact width of the scalloped elastic that will be used to finish these edges). The raw fabric edge of the lining will coincide with the finished outer edges of the outer layer of fabric in the bra back. When elasticising the top and bottom edge of the total bra back, the scalloped elastic which is sewn to the outer layer of fabric will simply be folded around the raw edge of the lining fabric edge, minimising the number of layers of fabric that are folded back onto themselves along the edge. ***When self-lining the bra back, the seam line bulk will also need to be minimised when you construct your bra.*** Once the seam that joins the centrepiece to the bra back has been sewn, trim back the enclosed raw edge (that of the bra back's lining layer) before the raw edges of this seam are parted and top stitched.

## ***DIFFERENT STYLES OF BRA BACKS***

The style of the centrepiece will generally determine the shape of the bra back pattern, especially in the underarm region, where the bra back joins to the centrepiece or the side of the cup. So ***select your set of instructions for drafting the bra back pattern piece, according to the style of your bra's centrepiece.***

Regardless of the style of a bra's centrepiece, ***the shape of the bra back's centre back closure region can be either: the regular style or the T intersection style.*** Depending on your confidence and bra needs, you may wish to experiment with your bra back pattern by converting it to the other style. In the regular style, the strap is sewn to the curved raw edge that leads down to the hooks and eyes, and in the T intersection style, the upper edge of the bra back is a straight line and the strap is sewn to it at a right angle (creating an upside-down T). Both of these options have their different advantages:

In the regular style of bra back,

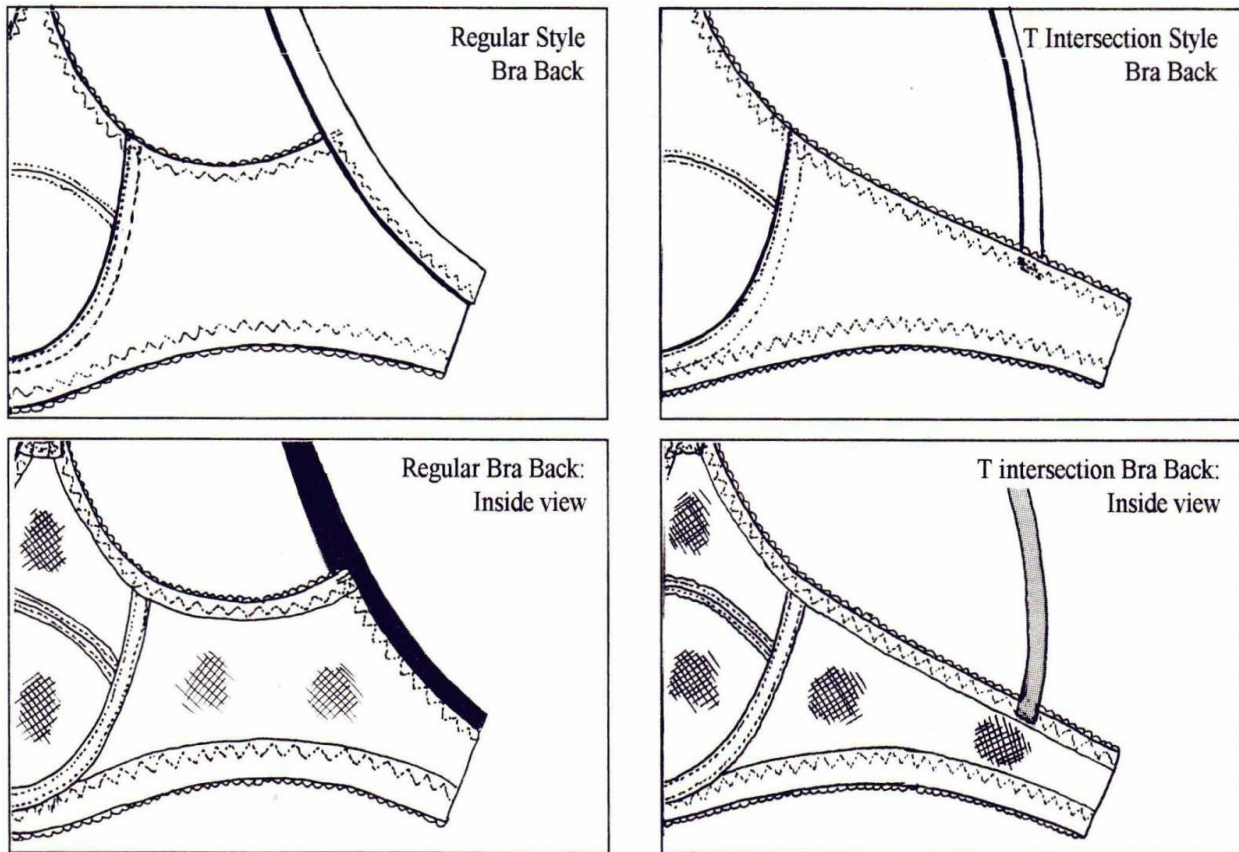
- the strap sewn down to the closure strengthens/reinforces that whole area of the bra back,
- the shape allows for a greater surface area of the body to be covered, making it easier to accomplish two objectives:
  1. design a stronger, more substantial bra back (which is necessary for the larger busted figures)
  2. angle the lower edge of the back downwards towards the centre back (in order to prevent the bra back from riding up).

In the T intersection style of bra back, the straps can more easily be sewn to the bra back extremely close to the hooks and eyes. Attaching the straps very close to the centre back like this,

- helps to prevent the bra straps from falling off the shoulders when the bra is worn and
- supports the weight of the breasts closer to the body's mid-line/centre of gravity. This is an important advantage, as it
  1. improves posture (the shoulders are 'straightened'/more held-

back, and the body 'stands taller')

2. the straps are moved slightly towards the base of the neck and away from the shoulder pressure points, producing a reduction in shoulder strain and fatigue



[page 24]

#### **STEP 5: DRAFTING THE BRA BACK PATTERN FROM A Y CENTREPIECE BRA**

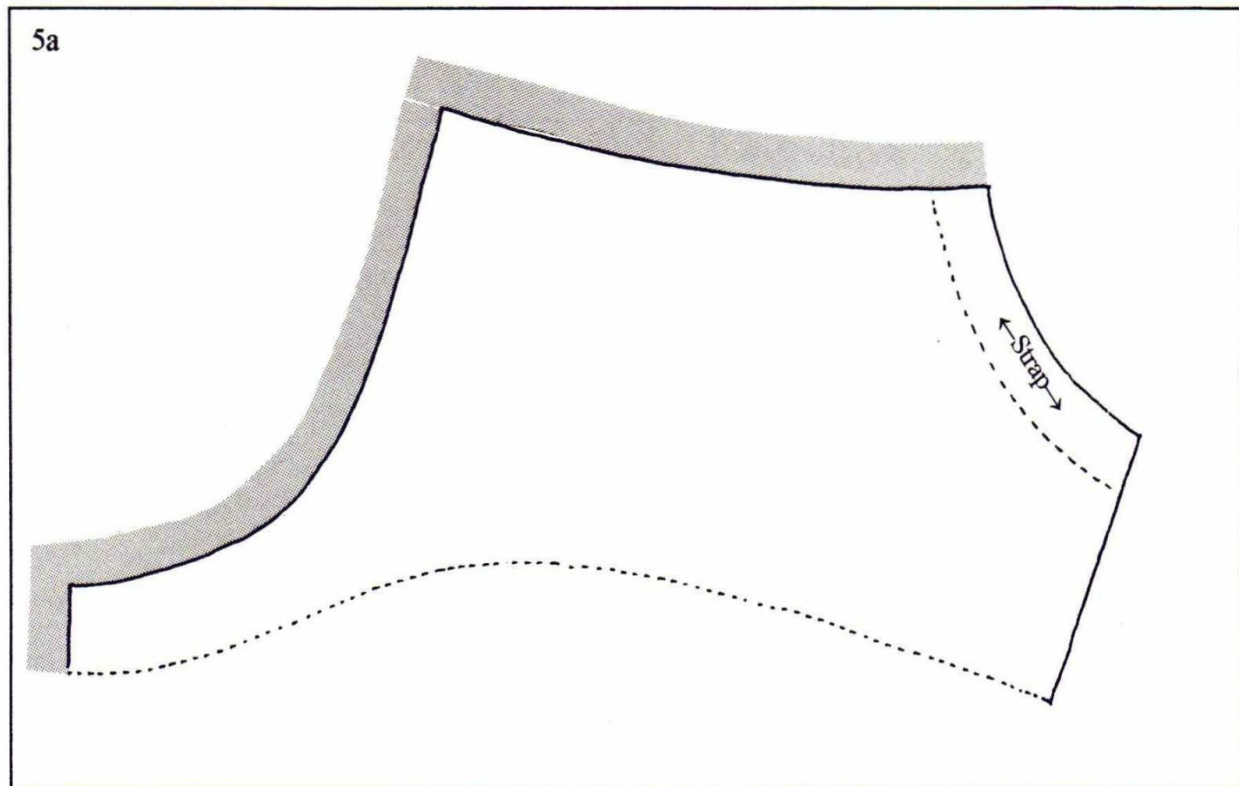
- ***Remove the underwire from the left breast cup.*** Retain this underwire for further use. You will be tracing the bra back that is now without its underwire (that of the left body side).
- ***Cut the left shoulder strap off the bra*** (or extend its length as much as possible)
- ***Clip/cut through the upper and lower edge scalloped elastic*** (at close intervals) ***and iron the bra back with a warm/medium iron.*** The bra back should be now able to lie flat.
- Place a piece of pattern making fabric over the bra back and pin it in



position.

- **Trace the bra back**, tracing in this order:  
**the short vertical seam under the cup** (that joins the centrepiece to the bra back)  
**the wire line seam**, (that joins the side of the cup to the bra back)  
**the top, underarm edge**,  
**the top edge of the strap** that leads down to the closure,  
**the closure edge** (positioning the line just short of the base of the first bank of metal eyes: this is where the raw fabric edge lies, remembering that flaps of the eye tab are wrapped around the raw fabric edge).  
**Lightly trace most of the lower edge of the bra back** (use a line of dots). Only trace the lower edge across from the closure to below the side of the cup, where it approaches the centrepiece. These steps are illustrated by the solid line in diagram 5a.
- Remove the traced shape from the garment  
**Add an exact 1cm seam allowance to all edges and seam lines except: the edge leading down to the closure, the closure edge itself, and the lower edge.** The seam allowance is the shaded area in diagram 5a.



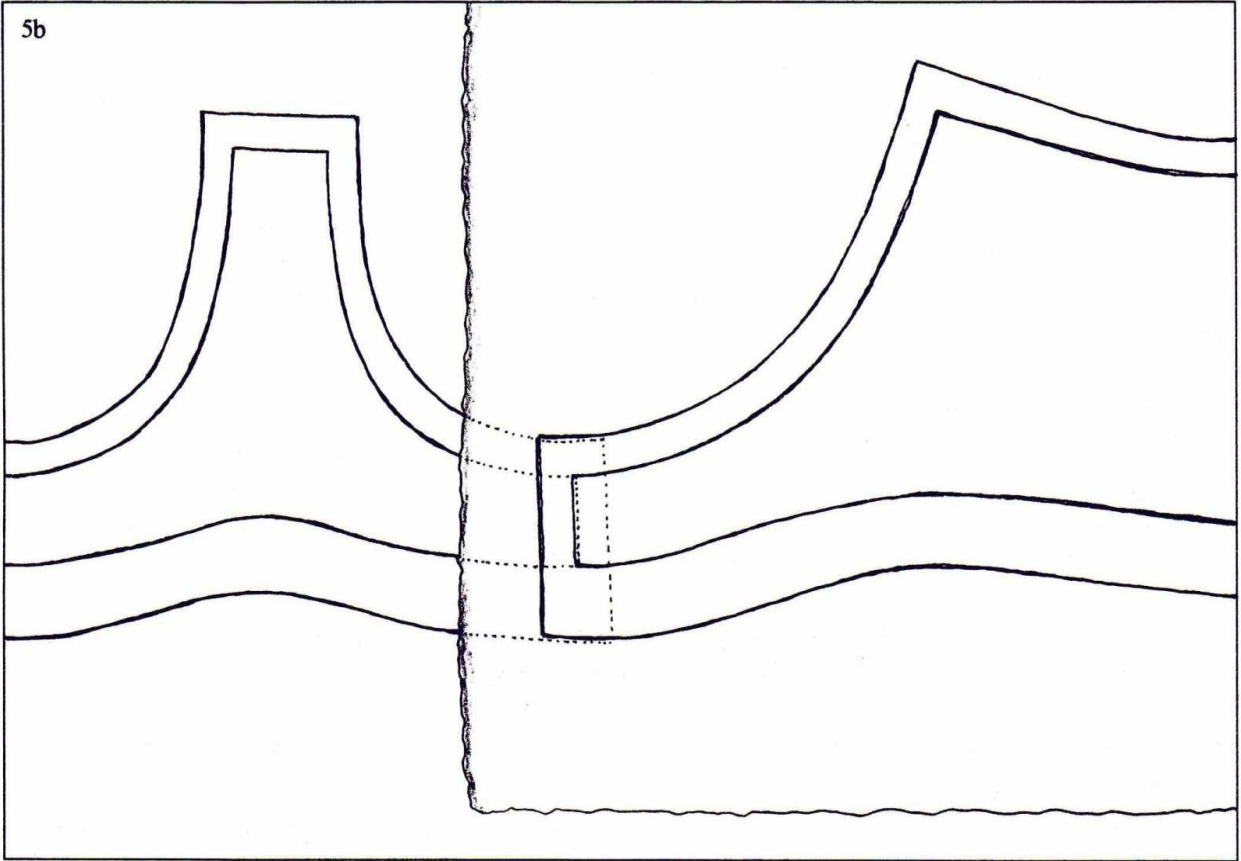


- **Lay the bra back pattern over the top of the centrepiece pattern**, so that the short common seam lines under the cup space are pinned together, directly on top of each other. Diagram 5b
- **Draw the lower edge onto the bra back pattern** so that it is a continuation on of the lower edge of the centrepiece (remembering that the lower edge should not be closer to the wire line seam than the width of the lower edge elastic plus 2mm). If the lower edge scalloped elastic to be used when your bra is sewn is wider than that used in the bra, the new bra back's lower edge will be below the dotted line.

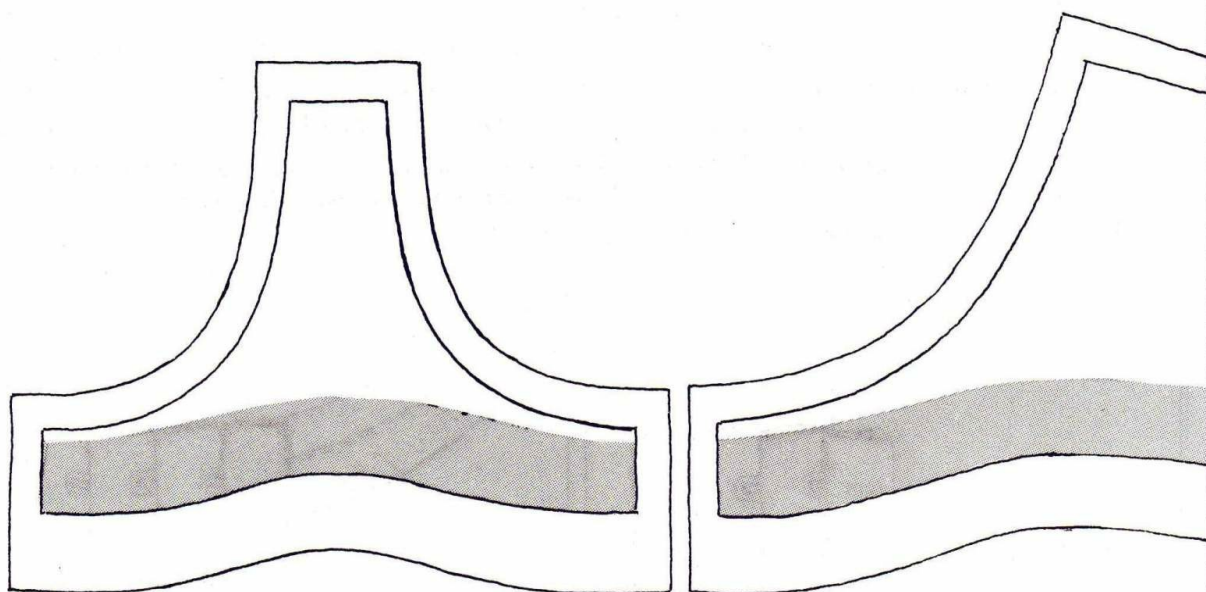
[page 25]

**Draw the bra back lower edge seam allowance** so that it is a continuation on of the lower edge seam allowance on the centrepiece pattern. This seam allowance will be the exact width of the lower edge scalloped elastic to be used when the bra is sewn.

5b



5c



The distance between the wire line seam and the finished garment edge under the bottom of each cup (on both pattern pieces, ) should be a fraction more than the width of the lower edge elastic. The shaded section shows where the elastic will be when it is turned upwards to be top stitched. Because the bra body under the cups was slightly wider than the width of the elastic, there is a slight clearance, allowing the wire line raw edges (and the casing sewn to them) to be folded downwards over the elastic and top stitched.

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It is very likely that the vertical spacing between the hooks/eyes in your pattern bra will be different to the spacing of the hooks/eyes in the ready-made tab or tape that you will be using when you sew your bras. Not all hook/eye tape has the same spacing, so for example, a three-hook-high tab on your pattern bra may be a very different height to the three-hook/eye-tab that you plan to use when you sew your new bra. This being the case, the next stage in producing the bra back pattern is to ***ensure that the height of the closure edge exactly corresponds to the number, and spacing of the hooks/eyes that you will be sewing onto your bras.***

Keep in mind that you need not have the same number of hooks/eyes that the manufacturers used. If you wish your bras to have a stronger, longer lasting and more substantial back in them, then this is up to you.

Your bra backs can be as delicate and petite, or as strong as you wish them

to be. You can simply clone the original bra back (using the same pattern and fabric), or you can substantially redraw it to improve its design. Regardless of the type of bra backs you will be having in your bras, ***design your back pattern's closure height according to the spacing of a hook/eye tape that is readily available to you***, rather than to the spacing of the tape that the manufacturers have used.

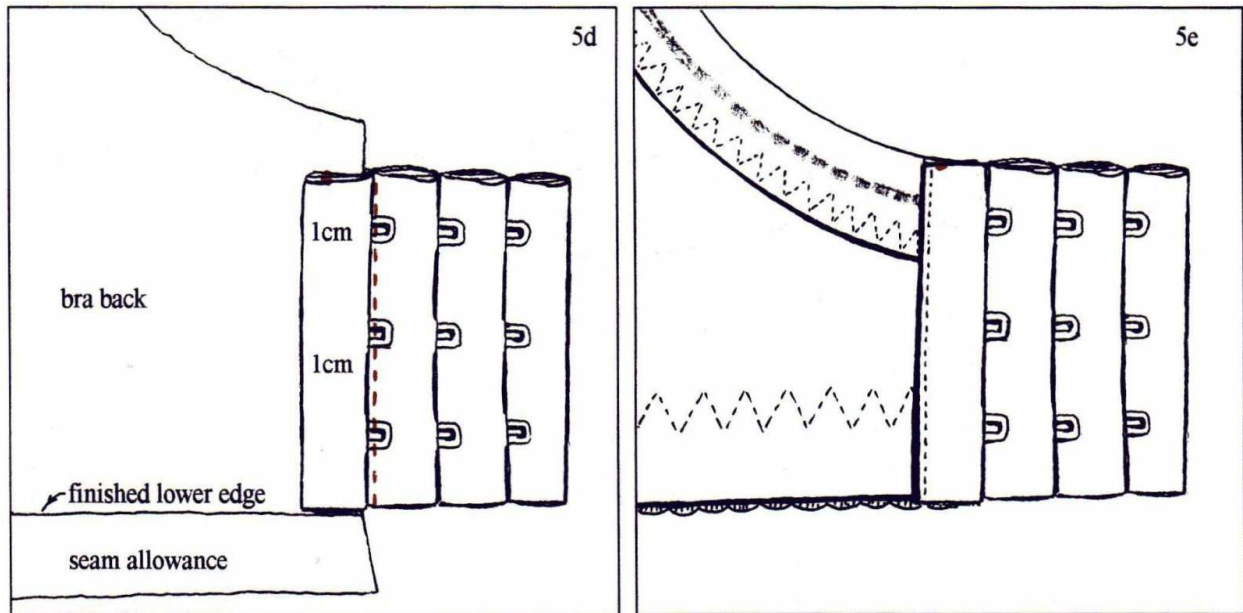
Also keep in mind that the hook/eye tape can be cut exactly mid-way between the hooks/eyes, or Alternatively, a stronger, more substantial tab can be produced by sacrificing the hook/eye just before, and just after the number you require ... doing this will provide slightly more fabric/sewing space across the top and bottom of the tab when you sew across the tab to seal its upper and lower edges. If this more substantial tab is preferred, the maximum amount of fabric on the hook/eye tape has to be included into the tab when it is cut, so cut through the tape as close as possible to the hooks/eyes on either end of the section you require.

- ***Cut the hook/eye tabs to the desired length.*** These tabs will be later sewn to the new bra, but they need to be cut, and used now, to determine the height of the closure edge on your pattern.
- ***Measure the eye tab against the closure edge on your pattern*** and amend the pattern as needed. When measuring the tab against the closure edge, be aware that the tab height should be measured: ***upwards from the finished lower edge*** at the centre back, and ***1cm in from the raw closure edge at the centre back*** (the 1cm-wide flaps of the tab wrap around the raw edge at the centre back).

So place the raw, bottom edge of the eye tab on the finished lower edge line on the pattern, and position the tab as if you are wrapping the flaps around the raw closure edge. Diagram 5e. The closure edge (indicated by a red dotted line) will lie underneath the tab, 1cm to the right of the flap's finished edge.

***Mark the top left corner of the tab onto your pattern*** (the red dot in diagram 5e). Once this point is marked, the tab can be removed, and ***the line indicating the cut edge that leads down to the closure tab can be drawn so that it goes through this point.*** If this line is correctly drawn so that it passes through the point, and the top edge

of the strap elastic is positioned right on the cut edge when the bra is sewn, the top edge of the strap will continue on into the top edge of the tab, giving a neat professional finish to the bra.

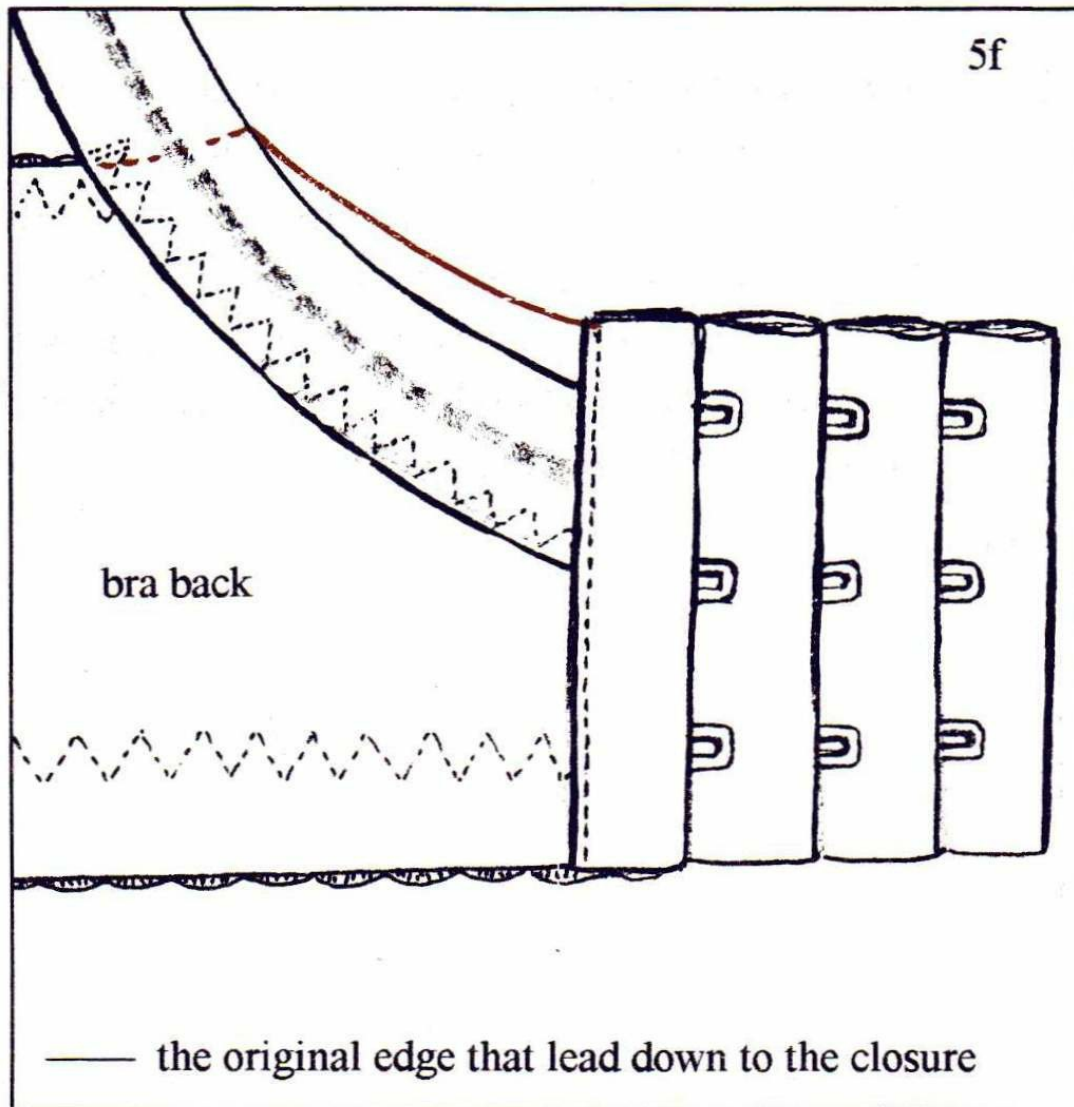


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***If your tab is just a little bit higher than that used in the original bra,*** and the closure edge is not quite high enough for the new tab, simply decrease the angle of the line that indicates the cut fabric edge that leads down to the closure (make it less steep).

This line should be drawn so that it exactly meets the top left corner of the eye tab's flap when the tab is correctly positioned according to the instructions on [page 26](#). Doing this will slightly increase the height of the centre back closure edge.

The lower edge of the bra back pattern will remain unchanged. In diagram 5f, the new edge leading down to the closure is drawn in red. Note that this new line passes right through the point that marked the top left corner of the tab flap.

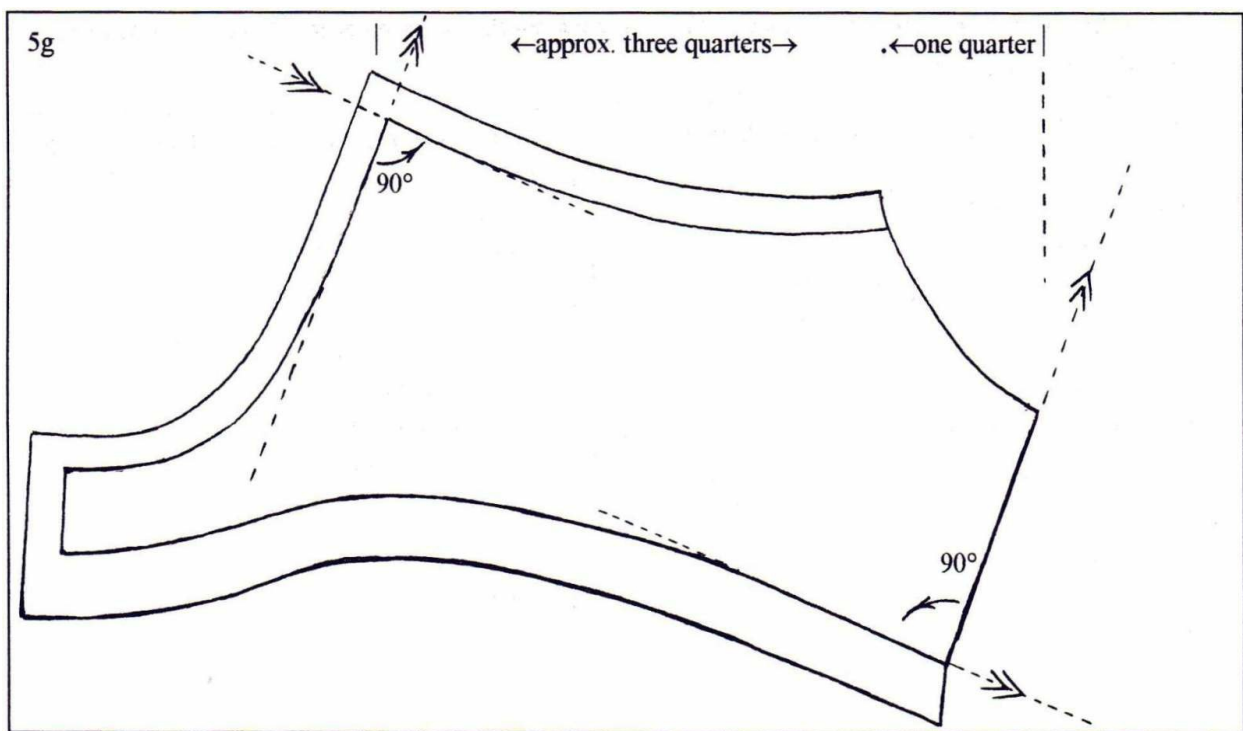


***If the tab you wish to use is significantly longer than that in the original bra, and the available closure edge is much too short to accommodate it, you have two options:***

1. ***Angle the lower edge of the back downwards as it approaches the centre back*** (begin increasing the angle from below the underarm area). Doing this will increase the depth of the closure edge, thus accommodating the longer closure tab, but will also make sure that the bra back will not ride up. Diagram 5g shows an analysis of a well-designed, substantial regular bra back of a Y centrepiece bra that will not gape under the arm, ride up, nor let the bra straps fall off the shoulders. Note the following aspects:



- the back strap attachment point is about one quarter of the way across from the closure to the edge of the cup
- the wire line seam (at the side of the cup space) and the centre back closure edge are roughly parallel
- the two 90 degree angles, and
- the two ends of the underarm edge, when joined by a straight line, will produce a line that is at a gently sloping angle. If your figure type is very bulky in the underarm region, the slight curve between these two points can be scooped out more so that the top underarm edge does not cut in.

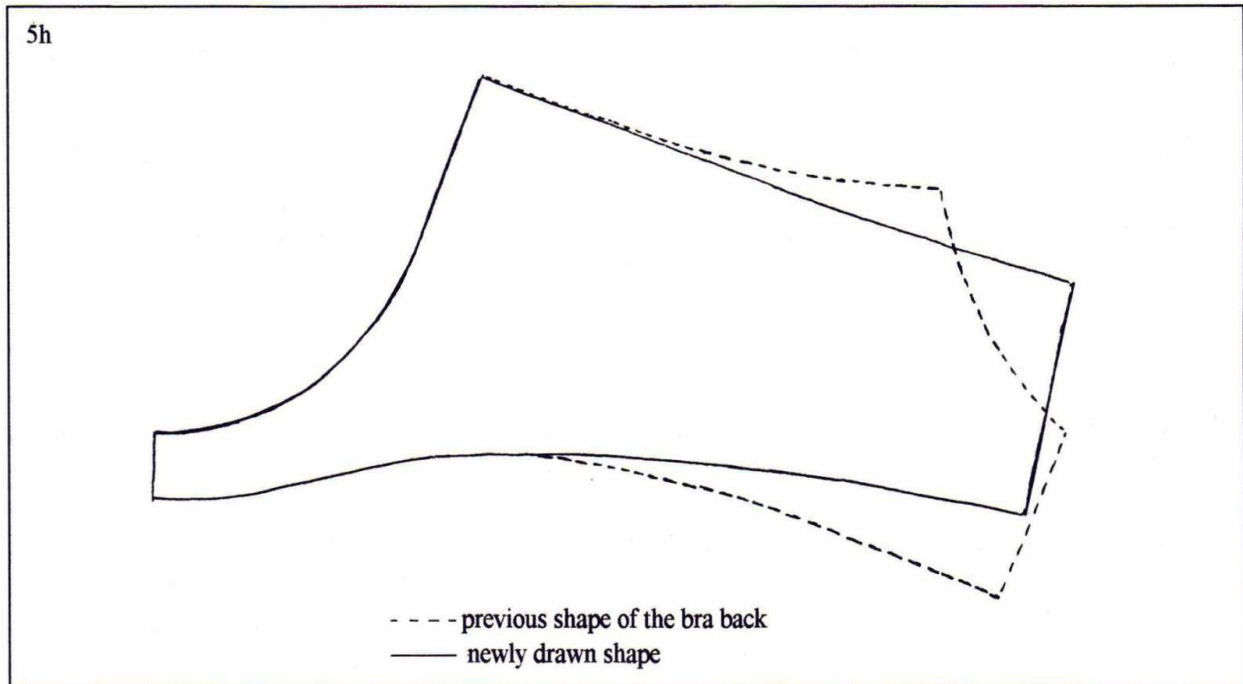


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**2 Convert the bra back into a T intersection style.** Doing this can increase the height of the closure edge, thus accommodating the higher tab. This can be achieved if you increase the slope of the underarm edge. To draw the new shape, follow the diagram below, using the tab to measure the height of the closure edge (measuring 1cm in from the raw closure edge)

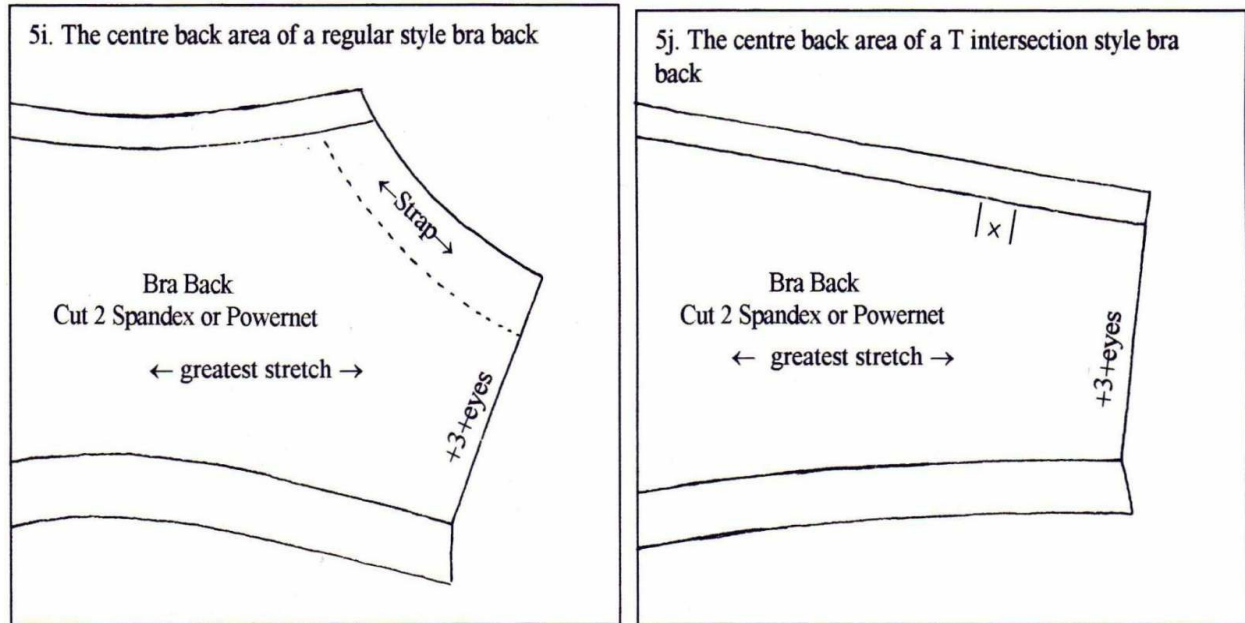
In the new T intersection style of bra back, note how the lower edge does not dip down so far at the centre back but how the strap end can be sewn to

the bra back much closer to the centre back if desired, making this style of bra back more likely to ride up, but better in preventing bra straps from falling over shoulders.



- ***Label your back pattern with the necessary information.***

When the pattern of the bra back is drafted, ***the number of hooks/eyes can be written on the closure edge***. If the tab is a more substantial one (where there is extra fabric on the top and bottom of the tab), this can be indicated by writing a plus sign before and after the number of hooks/eyes e.g. +3+ hooks/eyes. It is vital that ***the greatest stretch in the bra back fabric should go around the body*** and this can be indicated on your pattern by a labelled arrow. If the back style is regular, ***the strap leading down to the closure*** can be indicated by a dotted line, and then labelled. Diagram 5i. If your bra back is a T intersection style, ***the point where the strap ends are to be sewn to the bra back*** should be indicated thus: |x| Diagram 5j.

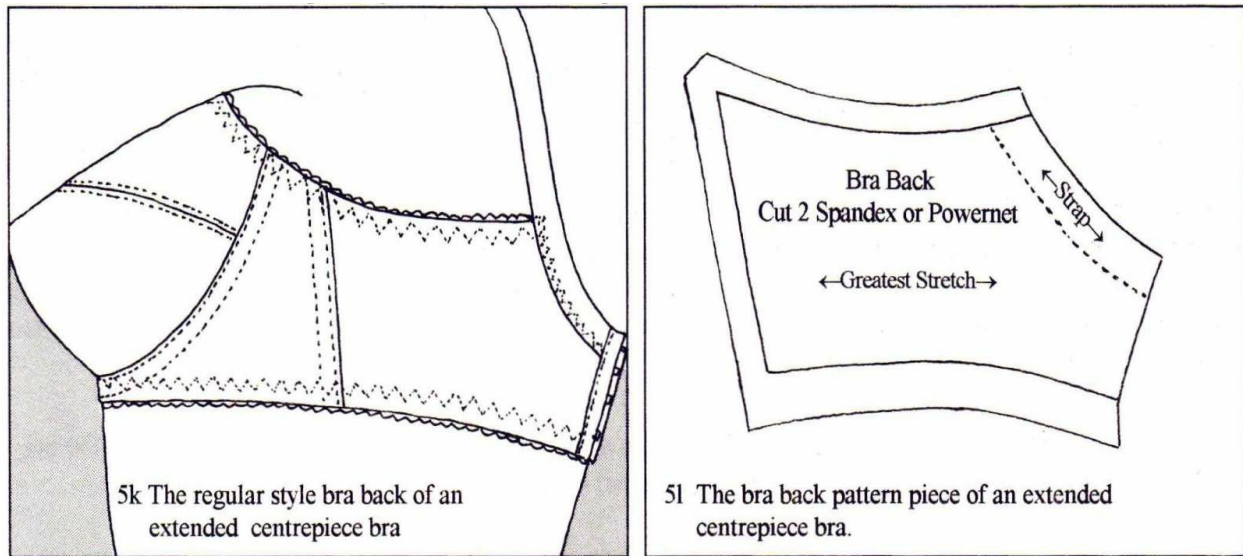


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### STEP 5: DRAFTING THE BRA BACK PATTERN FROM AN EXTENDED CENTREPIECE BRA

- **Cut the left-body shoulder strap off the bra**, (or fully extend its length). You will be drafting the pattern of the left-body-side bra back. The left-breast cup's underwire has been previously removed from the bra.
- **Clip/cut through the upper and lower edge scalloped elastic** (at close intervals) **and iron the bra back with a warm/medium iron**. The bra back should be now able to lie flat. **Place a piece of pattern making fabric over the bra back and pin it in position**.
- **Trace: the side seam** (that joins the centrepiece to the bra back) **the underarm edge,** **the top edge of the strap that leads down to the closure,** **the closure edge** (positioning the line just short of the base of the first bank of metal eyes: remembering that the flaps of the eye tab are wrapped around the raw edge). **Lightly trace the lower edge of the bra back** (use a line of dots).
- Remove the traced shape from the garment **Add an exact 1cm seam allowance to all edges and seam lines except: the edge leading down to the closure, the closure edge**

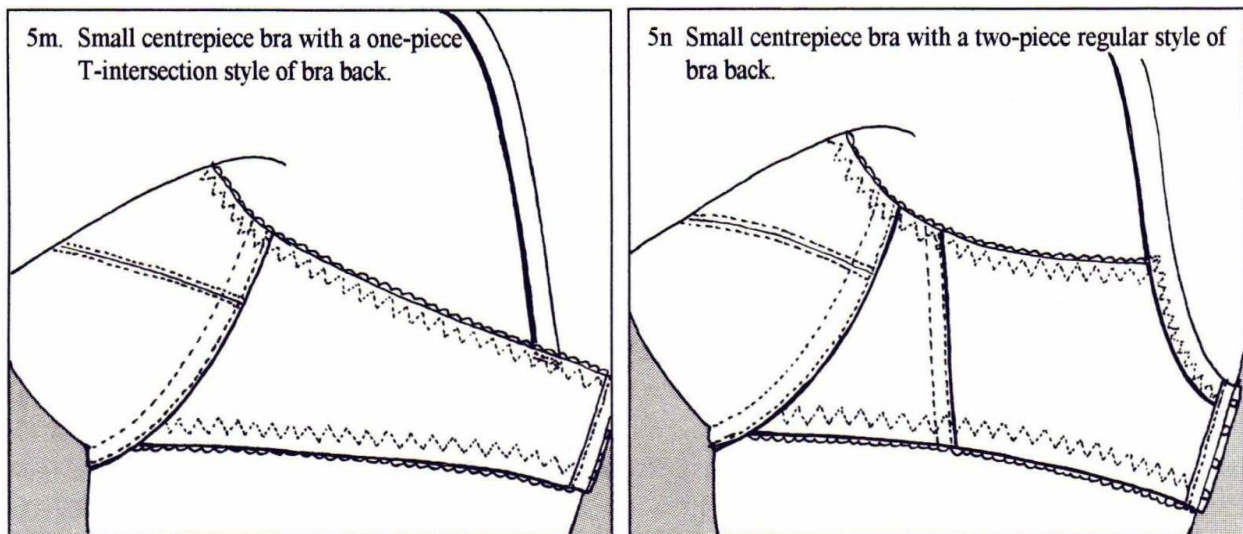
*itself, and the lower edge.*



- **Lay the bra back pattern over the top of the centrepiece pattern**, so that the common side seam lines are pinned together, directly on top of each other. Follow the technique in diagram 5b.
- **Draw the lower edge onto the bra back pattern** so that it is a continuation on, of the lower edge of the extended centrepiece. If the lower edge scalloped elastic to be used when your bra is sewn is wider than that used in the original bra, the bra back's lower edge that you draw will be below the dotted line.
- **Draw the bra back lower edge seam allowance** so that it is a continuation of the lower edge seam allowance on the extended centrepiece pattern (it will be the exact width of the lower edge scalloped elastic to be used when the bra is sewn).
- Follow the instructions on [pages 26, 27](#) and [28](#) so that the **closure height** perfectly matches your tab, and **all relevant information is written onto the pattern**. Note that alterations to the entire bra back will involve changing the direction of the edge-line from the side of the cup (from the wire line seam) ... i.e. the side area of the extended centrepiece pattern will need to be altered as well. To accomplish this, the two pattern pieces are to be overlapped, the common side seam pinned together, and the whole shape altered from the wire line seam to the centre back.

### **STEP 5: DRAFTING THE BRA BACK PATTERN FROM A SMALL CENTREPIECE BRA**

The bra back of a small centrepiece bra will be either a **one-piece bra back** (where one complete piece of stretch fabric extends from the line seam at the side of the cup to the centre back as in diagram 5m), or it will be a two-piece bra back (where the total back is divided into two sections with a straight side seam joining the two pieces of fabric in the underarm area ... diagram 5n). In two-piece bra backs, the shorter section that extends from the side of the cup to the underarm area is generally non-stretch in the horizontal direction (around the body), but may have significant vertical stretch or give. The longer section of stretch fabric that extends from the side seam to the centre back will have its direction of greatest stretch running horizontally. Both types of bra backs can have the shoulder straps sewn to them in a regular style or a T intersection style.



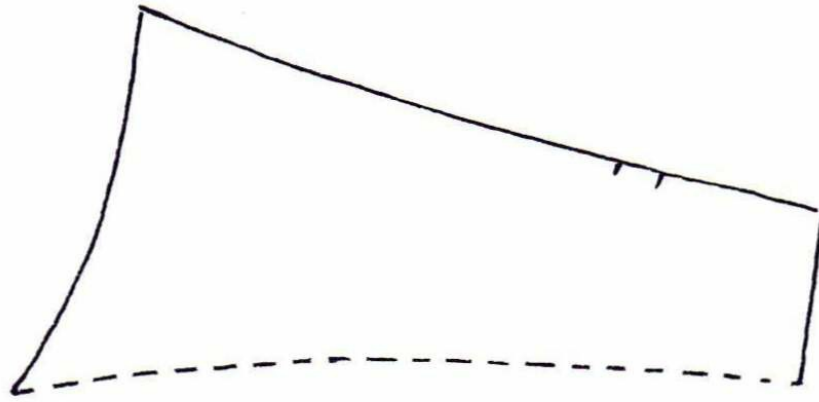
The pattern making instructions for both types of bra backs are virtually identical, except that with the two-piece bra back, the total back is traced (trace both sections as if they were one whole piece of fabric), and the side seam is drawn onto the pattern. Later when the initial pattern is complete, it can be cut along the side seam, each individual section is traced again (using a fresh piece of pattern making fabric), and a 1cm seam allowance is added to the side seams of both sections. To draft the pattern, work through the

following:

- ***Remove the left breast cup's underwire.*** Retain this underwire for further use. You will be tracing the bra back that is now without its underwire (that of the left body side).
- ***Cut the left-body shoulder strap off the bra,*** (or alternatively extend the left-body shoulder strap to its maximum length).
- ***Clip through both the upper and lower edge elastic at close intervals*** (from the side of the cup to the centre back) and ***iron the bra back with a warm/medium iron.*** The fabric will now be fully relaxed. Pin a piece of pattern making fabric over the bra back.
- ***Trace the bra back.*** Diagram 5o. Trace in this order:  
***the wire line seam,*** (that joins the cup to the bra back)  
***the top, underarm edge,***  
***the edge that leads down to the closure***  
***the closure edge*** (positioning the line just short of the base of the first bank of metal eyes: this is where the raw fabric edge lies, remember that the flaps of the eye tab are wrapped around the raw fabric edge).  
***Lightly trace the lower edge of the bra- back*** (use a line of dots).  
This lower edge is only approximate, as the position of the closure tab has not yet been finalised.



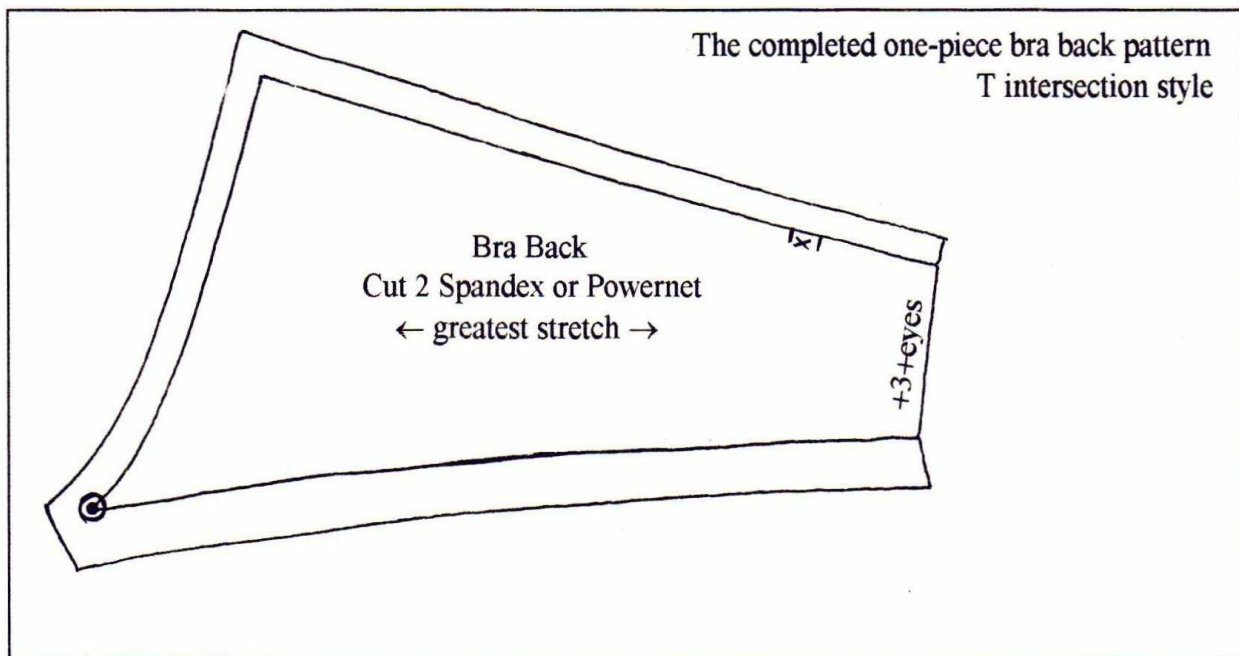
50 Small centrepiece bra back: a one-piece, T-intersection style of bra back.

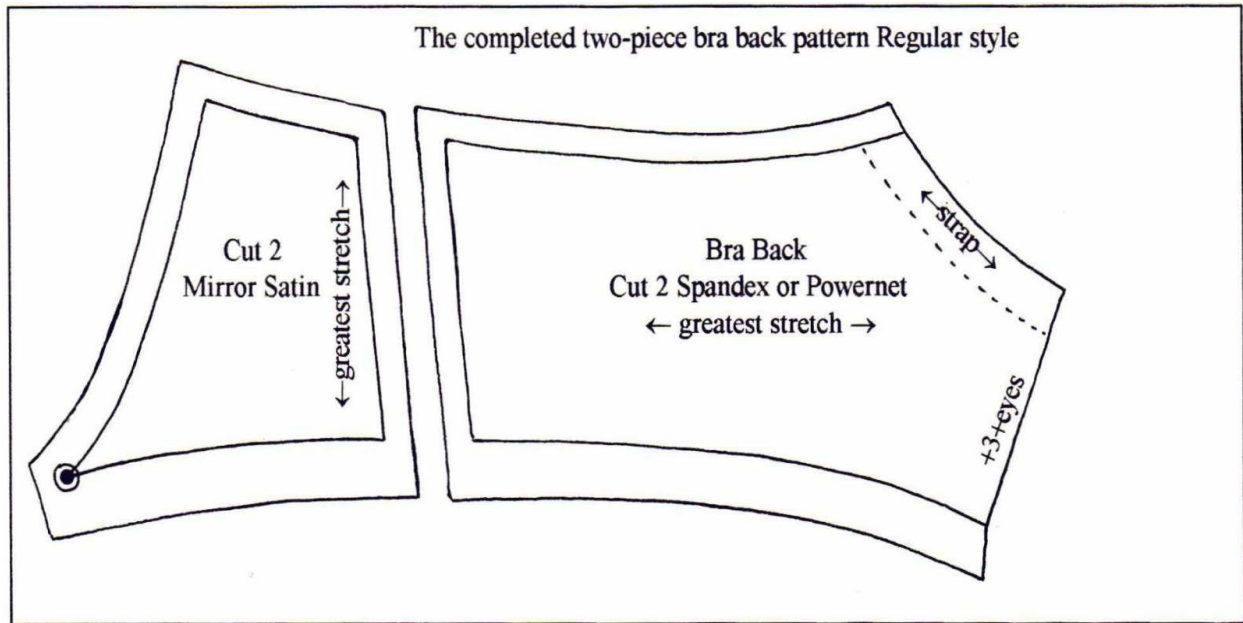


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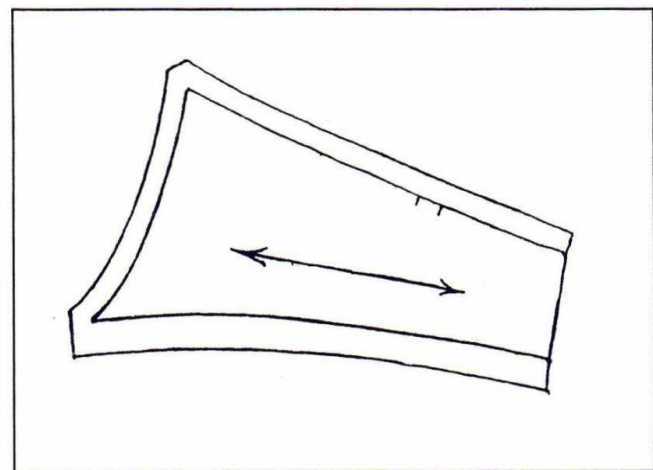
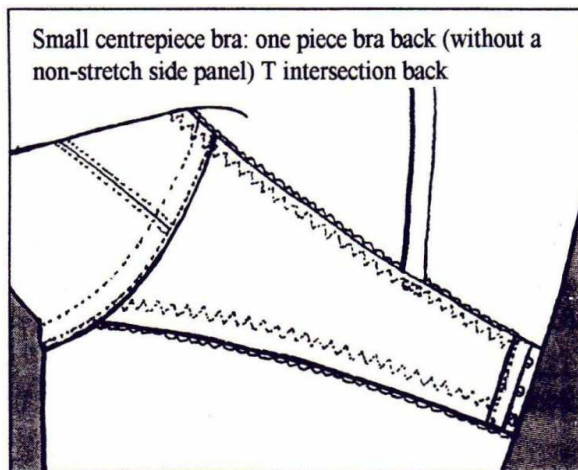
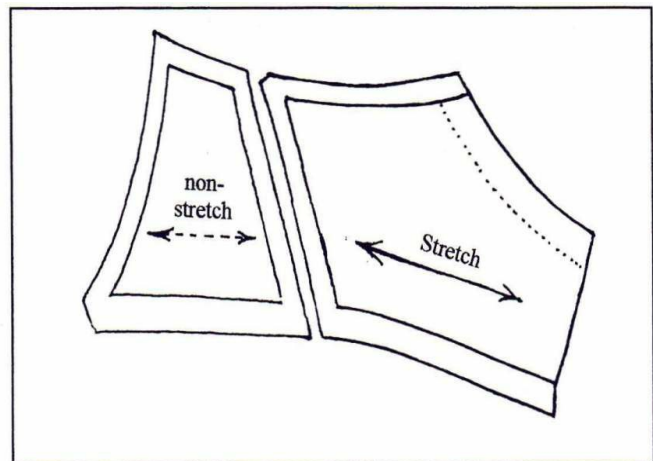
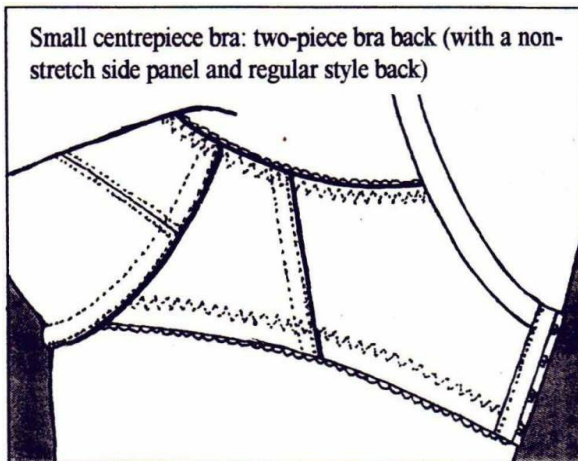
- If your bra back is a two-piece back, now is the time to **draw the side seam onto your pattern.**
- Remove the traced shape from the garment  
**Add an exact 1cm seam allowance to all edges and seam lines except: the edge leading down to the closure (regular style), the closure edge itself, and the lower edge.**
- Follow the instructions on [pages 26, 27](#) and [28](#) so that the **closure height** perfectly matches your tab, and the bra back is designed according to your requirements. The point at which the lower edge of the bra back joins onto the cup is particularly important and should be clearly marked onto both the back pattern, and later onto the cup pattern.
- Once the height and position of the closure edge have been determined, **the lower edge can be finally drawn, and its seam allowance added** (the lower edge seam allowance should be the exact width of the lower edge scalloped elastic to be used when the bra is sewn).

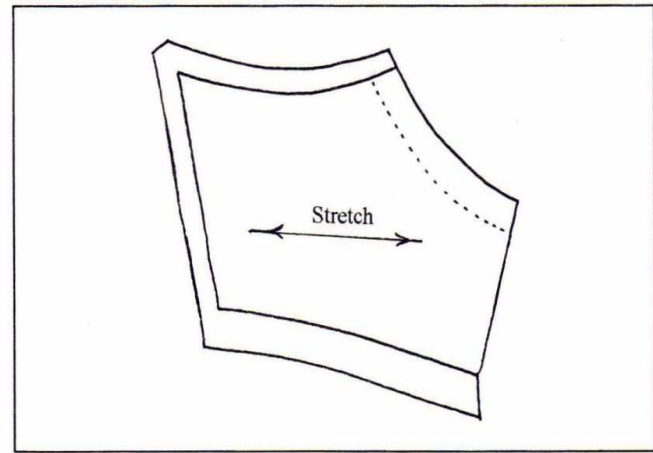
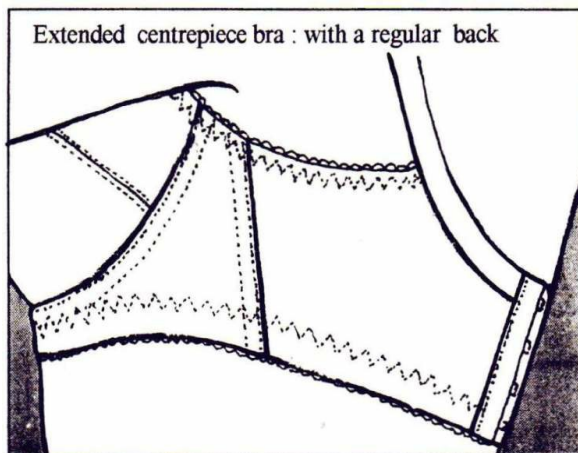
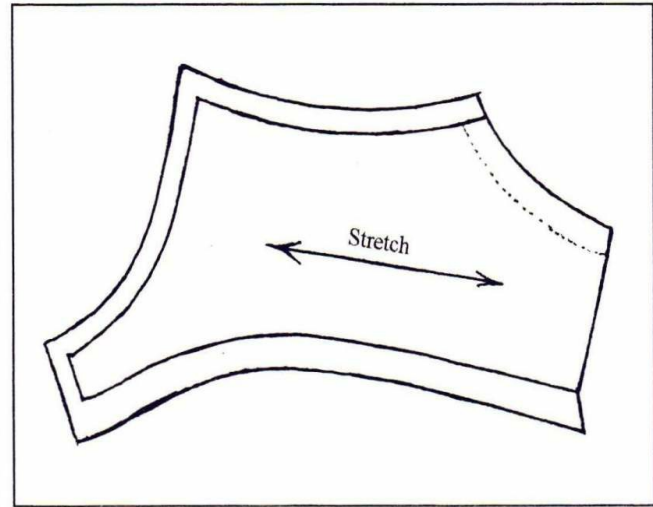
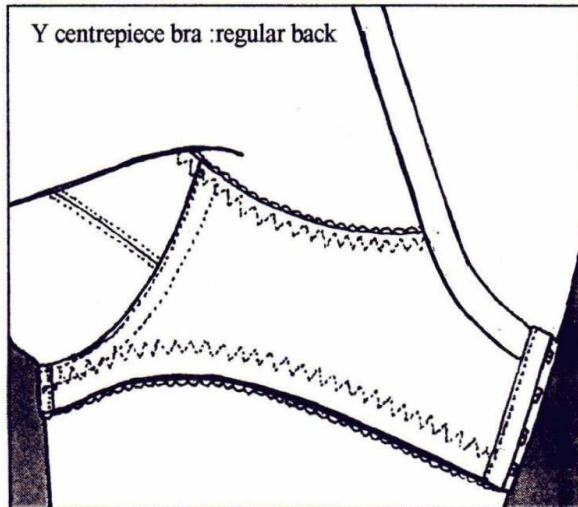
- If you have a one-piece bra back, ***all relevant information should be written onto the pattern.***
- If you have a two-piece bra back, ***cut your back pattern into two*** by cutting along the side seam. Using a fresh piece of pattern making fabric, ***trace each individual section, adding a 1cm seam allowance to the side seams on each section. Label each section of the bra back with all relevant information,*** paying particular attention to the labelled arrows that indicate the direction of greatest stretch contained in the fabric.





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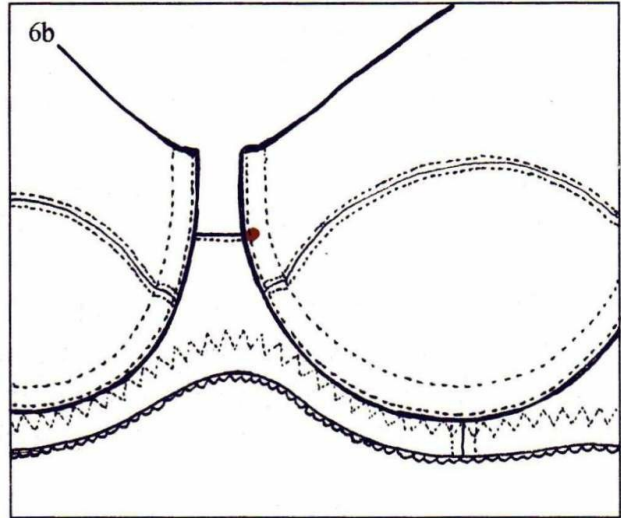
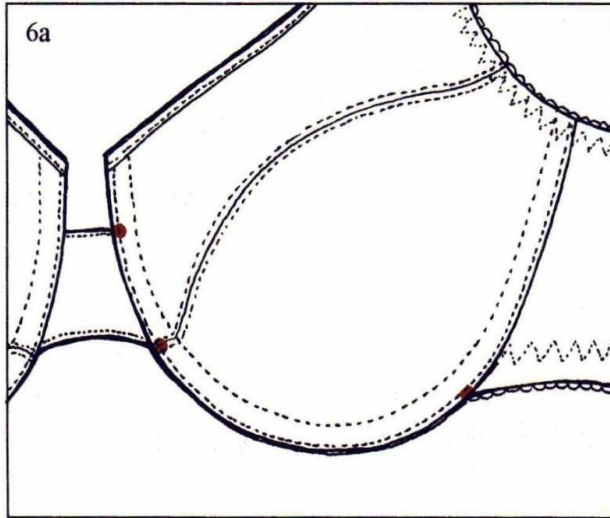
[page 33]

## Drafting the Pattern of the Cup

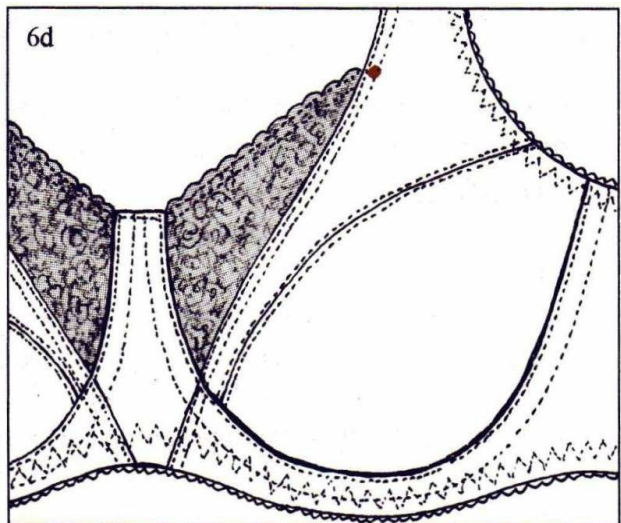
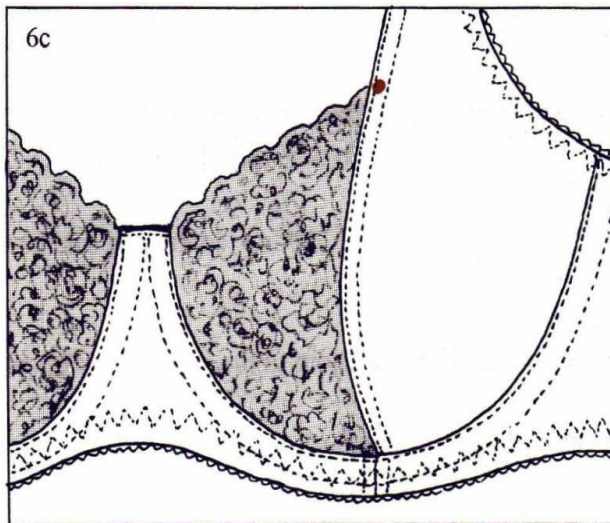
### STEP 6: DRAFT THE CUP PATTERN

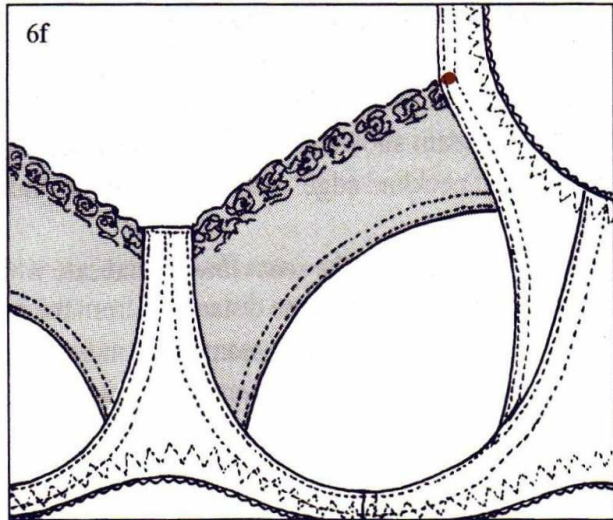
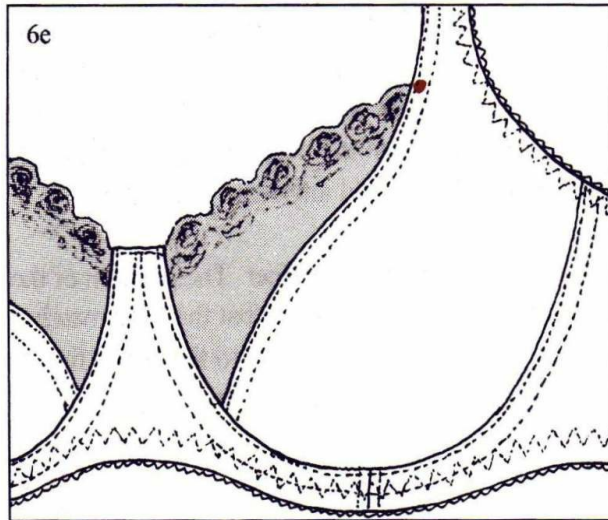
- If your bra has a small centrepiece or a u-shaped space centrepiece (diagrams 6a and 6b below), **mark the following alignment points onto the wire line seam of the left breast cup fabric.** These important alignment points are indicated by red dots below and are: where the top finished edge of the centrepiece joins onto the cup, where the lower finished edge of the centrepiece joins onto the cup (small centrepiece bra), and where the lower finished edge of the bra back joins onto the cup (small centrepiece bra).





- If the finished neckline edge is joined to a higher, side-cup section (part-way along another cup piece), the point at which the two finished edges join, should be marked onto the fabric of the side section. These cup alignment points are also important, and are indicated by red dots in diagrams 6c, 6d, 6e and 6f





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- ***Cut the left breast cup out of the bra.***

Using very sharp scissors cut right along the seam line that joins the cup to the bra body (a seam line is where one piece of fabric meets another piece of fabric, and the bra body is the centrepiece plus the bra back).

- Using a fine-point felt-tipped pen, ***add directional markings to all sections of the cup*** indicating:

the top of each cup piece (with a small letter T),

the part of each cup piece that goes toward the centre front of the bra (with a small letter C) and

the part of each cup piece that goes toward the side of the bra (with a small letter S).

Note: these directional markings will also be written onto the cup parts with a water-soluble felt-tipped pen, once they are cut out, thus ensuring major construction errors are avoided when the bra is sewn.

- Using very sharp scissors ***cut accurately along the seam lines that join the cup pieces together.*** Remember that a seam line is where one piece of fabric meets another piece of fabric.

- ***Remove any top stitching.*** Top stitching often pulls the edge of a cup section in slightly, even though this is not readily apparent, so the top stitching must be removed/nullified in order to obtain an



accurate cup pattern. This can be quickly done by using a sharp pair of scissors, and cutting tiny, closely-spaced nicks at right angles to the edge, and through, the top stitching. This will allow the cup sections to lie flat.

- ***Clip through any edge elastic.*** Ensure that the nicks are closely spaced and that they go through to the inside edge of the elastic.
- ***Iron each cup piece with a warm-medium iron.*** Use a pressing cloth so that there is no danger of the sole plate of the iron sticking to, and burning the cup fabric.
- Pin pattern making fabric on top of the cup pieces, being careful to leave the cup pieces as flat as possible.

***Trace around the very edge of each cup piece*** using a very fine tipped pen or a very sharp pencil.

***Label each cup section onto your pattern:*** e.g. 'A' for the upper cup.

***Write the small directional letters onto your pattern*** (T, C and S indicating the top, centre and side of each cup section).

***Mark any important alignment points onto your pattern***

- where the finished upper and lower edges of the centrepiece and bra back join to the cup (if your bra is a small centrepiece or U-shaped space style)

- where the finished neckline edge joins to a side cup piece (diagrams 6c-60)

- Unpin your cup pattern pieces. ***Add an exact 1cm seam allowance to all edges of the traced shapes, except where there is a scalloped lace self-edge, or an edge that isn't finished off with elastic or a hem.*** If the neckline edge is the scalloped edge of self-edged lace, or if it is a cut edge (which has no fabric turned over ... perhaps edged with narrow edging lace on the outside and edged with bias strip on the inside), a seam allowance should not be added to the neckline edge on the pattern. Rather, indicate: 'finished neckline edge' under the edge on your pattern and do not add any seam allowance.
- ***Draw notches onto the seam lines*** to indicate which seams are to be sewn together. The position of the notches should be the same distance in from the ends of the common seam line so that they will match up later. One single notch on a seam line ▲ indicates a matching-up point that is closest to the centre front line of the

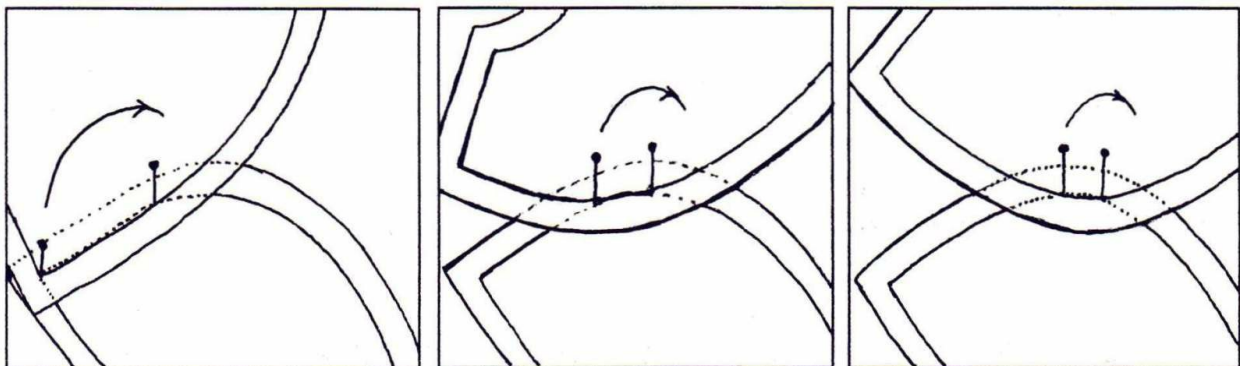
garment, and a double notch on a seam line ▲▲ indicates a matching-up point the is closest to the centre back line of the garment.

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## Checking the Length of the Seam Lines

- **Check the relative lengths of the cup seam lines** (which are to be joined together within the cup). As the cup seam lines are often curved, the pattern pieces can't simply be laid next to each other to make sure they are the same length, so the seam lines which are to be joined must be overlapped and you have to 'walk' across the seam using two pins:

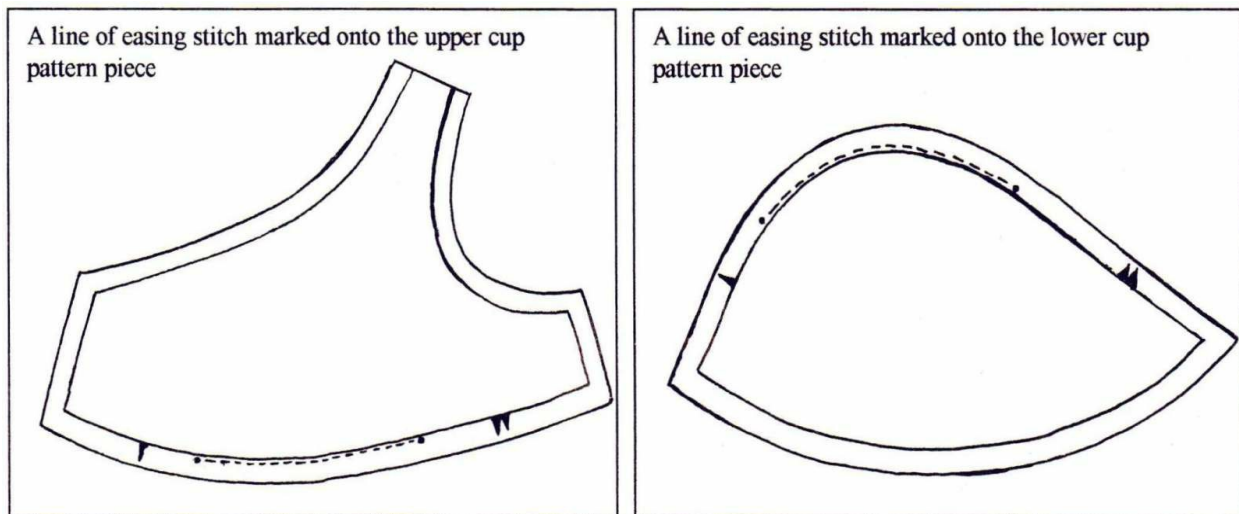
Lay the two pattern pieces in front of you, then at one side overlap them where the common seam line begins. Put a pin through both pattern pieces at this point - so that both pieces can swivel or pivot at the pin-point. Lay the seam lines on top of each other for as far along the seam as they can, keeping both pattern pieces lying flat. Where the two seam lines diverge or part, pierce the patterns with another pin (creating a new pivot point). Remove the first pin and repeat this process, 'walking' across the common cup seam until the end of the seam is reached. If one of the seam lines is slightly longer, it will have an overhang at the end of the 'seam', indicating that it needs to be eased in so that it is the same length.



- Where this is the case, **mark an easing stitch onto the longer seam line, positioning it from the centre front out to 2/3 of the way across the seam line.** Positioning the easing stitch in this way will

ensure that the fullness of the cup is from the bra's centre out to the side of the nipple (where it is needed).

Easing stitches are, a line of long straight stitches (like a gathering stitch) and this line of stitching should be sewn right on the longer edge's 1cm seam line (before the cup pieces are sewn together). The bobbin thread should be pulled tight a little bit to slightly 'grab' the longer seam line in, just enough to make the fabric cup piece 'cup' on a flat surface and prevent it from lying flat. This 'grabbing in' of the longer edge will make it the same length as the shorter one, and has the added advantage of producing a less pointy, more rounded tip on the cup. An easing stitch used in this way will gently and invisibly overcome a seam line length difference of up to 2cm.



Note: If your cup fabric is ***virtually non-stretch*** (e.g. made out of a bonded lace or a bonded tricot: either lace or tricot bonded to rigid stabiliser) and if the lengths of the central cup seam lines are identical or nearly identical, ***an easing stitch should be drawn on both upper and lower cup seam lines, positioned around the nipple area*** (across the middle 1/3 section of each seam line). Using an easing stitch in this way will ***'round off' the tip of the cup when the cup is made out of a rigid cup fabric.***

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- ***Identify the type of lace or fabric in each cup section and write this information onto the pattern.*** If assistance is needed in identifying a

particular fabric, take the cup part to a reputable fabric dealer, or post the cup part to a bra haberdashery supplier (include a stamped, self-addressed business sized envelope).

- ***The stretch qualities of each cup part are to be analysed, and indicated on the cup pieces with arrows. Once the rows are drawn onto the cup parts, they can then be traced onto the pattern pieces and appropriately labelled.***

Give each cup part a strong tug in both the north/south direction as well as in the east/west direction (according to the lines in the knit) to ascertain just how much give or stretch there is within the cup fabric. The term '**give**' indicates that the fabric will expand when pulled, simply because as a knitted fabric, it will possess some movement/flexibility.

The term '**stretch**' indicates that elastane (elastic) is knitted into the fabric, causing it to bounce back after it has been pulled.

There can be various combinations of degrees of give or stretch in cup fabrics. For example, a good quality nylon lycra has excellent multi-directional stretch ... so much so, that it is sometimes difficult to tell which is the direction of greatest stretch. In this case, a close scrutiny of the pattern of the knit may be required to clarify the issue. Double-knit tricot on the other hand, has a moderate give in one direction and only a slight give in the other so for this kind of cup fabric, two appropriately labelled and positioned arrows can be added to the pattern.

- ***Trace around the shape of the underwire that came out of the left breast cup. Send or fax the tracing to a bra haberdashery supplier so that your underwire shape can be matched up as closely as possible, and new pairs can be sent to you.*** For the first bra that you sew, the underwires from your pattern bra can be recycled (if they are still in good condition), but care has to be taken to insert them back into the same cup, the way they came out (with the correctly coloured tip to the bra's centre). This ensure that the bending in the wire (that has occurred as it conformed to the shape of your ribcage) will still conform to the shape of your ribcage in the new bra. If an identically-shaped wire is unavailable, have them select the nearest replacement wire shape. Specify that you would prefer:

- a wire that has slightly **lower tips** rather than slightly higher tips,
- a wire that is a slightly **wider U-shape** rather than one that is a more compressed U-shape.
- Also ensure that the length of the new wire is not longer than the original wire.

If the closest wire shape is one that has uprights that are much too high, then one or both of the wire uprights can be successfully re-tipped, using powdered plastic (identical to the plastic used on metal grid refrigerator shelving).

To re-tip an underwire, the excess section of wire should be cut off with metal snippers, the sharp side points filed off and beveled with coarse sand paper, the tip should be heated in a gas flame until just about to turn a dull red and then dipped into powdered plastic for one second. The heat within the wire tip melts the grains of plastic onto it.

- The following information should be kept with the pattern or on it:  
the **Brand** of the bra,  
the **Size** of the bra pattern,  
the **Style** number,  
**who the pattern is for**  
the **wire number** and additional wire information (which wire tip goes to the centre of the bra)  
**any modifications** made to the original pattern

e.g. FARFORM. Size 16E style 7568 with the edge lowered. Helen James Wire no. 63579 white tip to centre with 2 ½ cm cut off the green/side tip

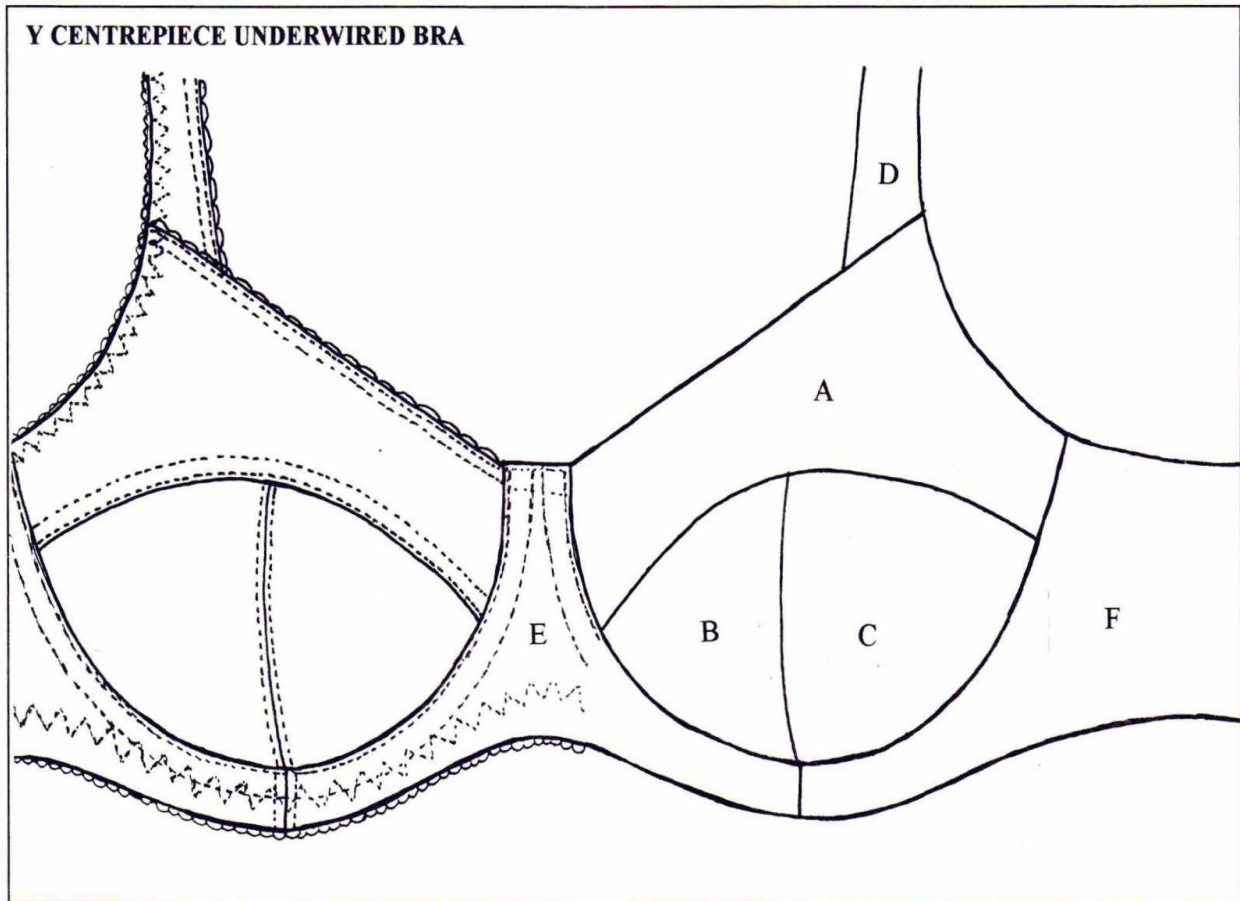
[page 37]

## **STEP 7: COMPLETE YOUR BRA'S STYLE DIAGRAM AND COLOUR-CODE THE ORDER OF SEWING**

- On the **left side of the style diagram** that was drawn using the template, using a very fine black pen, **draw all the lines of stitching** as they appear on your bra: all zig zag stitching, top stitching and pin-stitching (which is top stitching positioned a pin-width away

from a seam line).

- On the **right side of the style diagram** that was drawn using the template, using a very fine black pen, **label all the sections of your bra** using the letters A, B, C etc. that were initially onto the bra parts. An example of a bra style diagram is below.



- **When you are sewing your first bra**, using the instructions/principles in this book, **write a concise list of your order of sewing**. e.g. This list should be written onto a large piece of paper, and should be positioned **below the design sketch of your bra**. e.g.
1. Bind the top edge of the centrepiece (E) between the cup spaces.
  2. Seam E to F under each cup space. Part raw edges and top stitch as shown.
  3. Seam B to C. Part raw edges and top stitch. Trim back raw edges to top stitching.



4. Reinforce D's neckline edge using narrow lace and cotton tape
  5. Sew D in its finished position behind A. Reinforce A's neckline edge using lace and cotton tape
  6. Sew an easing stitch to lower cup's mid cup seam line. etc.
- ***Colour-code the seam lines/edges in the order that they are sewn/finished.*** Doing this will combine the set of instructions you have written with the diagram of your bra's style and make the order of sewing very easily deciphered when your pattern is next used. Beside the numbered steps (in the margin, next to the number), draw a coloured line using a felt-tipped pen, and then draw over the appropriate seam line on the right side of your bra style diagram. Each seam to be sewn and each edge of the bra that is either hemmed or elasticised will have its own instantly recognisable, individual colour.

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## ***DRAFTING THE PATTERN OF A NON-UNDERWired BRA***

### ***Preliminary Information***

- Drafting the pattern of a non-underwired bra is in essence, a relatively simple matter of cutting the bra up along its seam lines, ironing the pieces flat, tracing each section, and adding appropriate seam lines to the traced shapes.
- The shape of the underwire in underwired bras to a large degree standardises the design of these bras ... they all have some sort of a centrepiece and two wire line seams. Non-underwired bras on the other hand, come in a much larger variety of styles, and their styles can range from being very simple to being similar to quite complicated jigsaw puzzles. When constructing these bras, it is vital that each piece of the bra be correctly aligned with the rest of the bra. This makes the labelling of each bra section, the use of alignment letters on each section (C, S and T) and a clear and accurate style diagram, all absolutely necessary in the process of drafting the pattern and constructing the bra.
- I have found that non-underwired bras with extended centrepieces,

(that extend from side-seam to side-seam) it is important to clip the bottom-edge elastic all the way around the bra to prevent it from pulling the pieces in and making your pattern pieces too small to go around your rib cage. If you think that any edge of your bra has had stretched elastic sewn to it and is pulled in slightly, clip through the elastic edge at multiple points so that when you draft your pattern, the shape and size of all pattern pieces are as accurate as possible.

- As top stitching can contract a seam line or an edge, nick through any top stitching at close intervals or remove the stitching altogether.
- On each pattern piece, clearly label both the degree and direction of stretch in the fabric. The success of the new bra you will sew partially depends upon using either the same type of fabric (with identical stretch properties) or another type of fabric (which has very similar stretch properties).
- Many of the pattern making techniques used to draft the pattern of a non-underwired bra are very similar to the techniques used in drafting the pattern of an underwired bra, so throughout the following instructions, previous pages will be referred to.

### ***STEP 1: MARK ALL THE SEAM LINES ON YOUR BRA***

To prepare the bra, using a fine point felt-tipped marker, draw along all the seam lines and outer edges of the bra (where the fabric folds underneath the bra ... along its very edge).

If your bra is dark in colour, trace over the seam lines using a line of liquid paper or dots of liquid paper (correction fluid). These lines, when drawn onto your bra, will clarify where the seams are.

Keep in mind that a seam line is where one piece of fabric meets another piece of fabric, not where the lines of top stitching are. The top stitching only indicates the direction in which the raw edges produced by the seam have been flipped to be sewn flat.

If in doubt about the position of a seam line, observe diagrams 1a and 1b on [page 10](#).

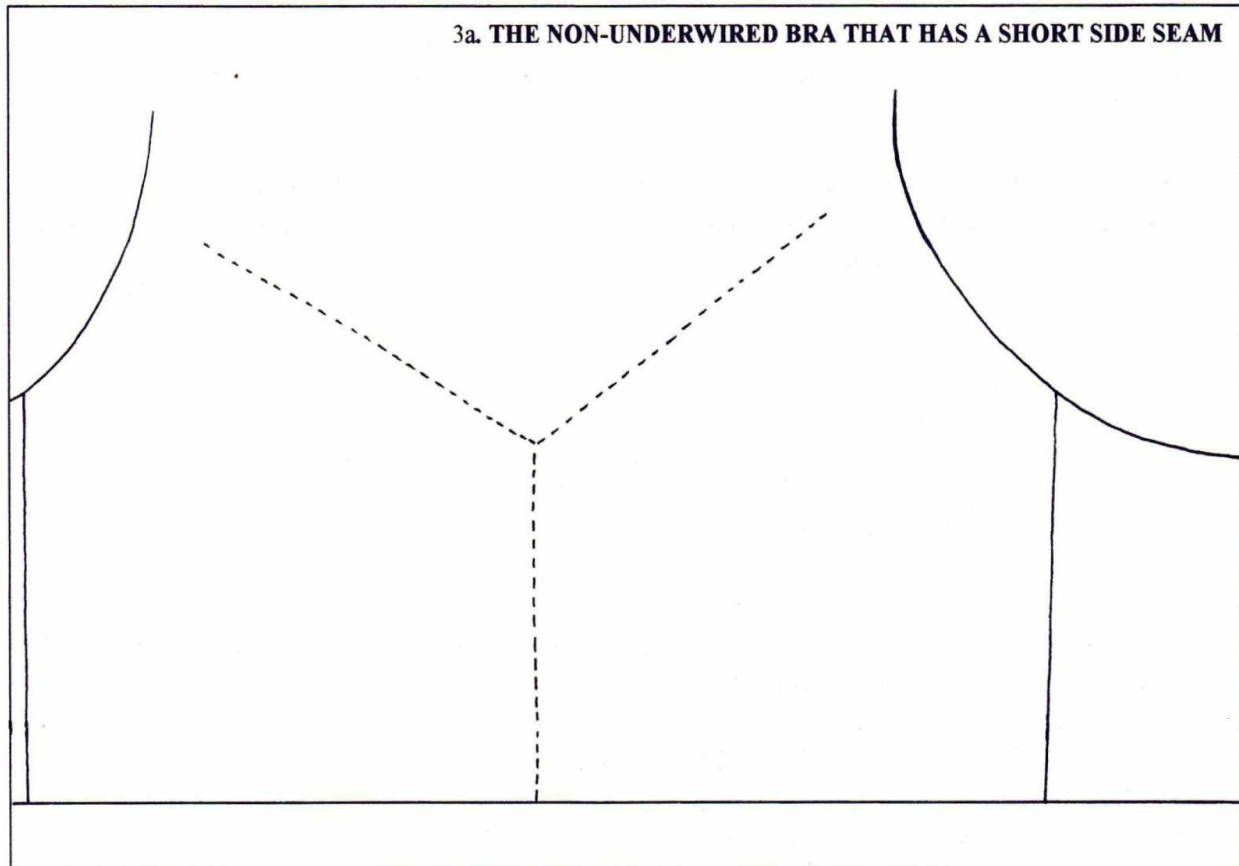
It may be necessary to cut away/remove any decorative elastic or narrow lace that is often sewn onto the bra, concealing the seam lines.

## ***STEP 2: LABEL THE VARIOUS PARTS OF THE BRA***

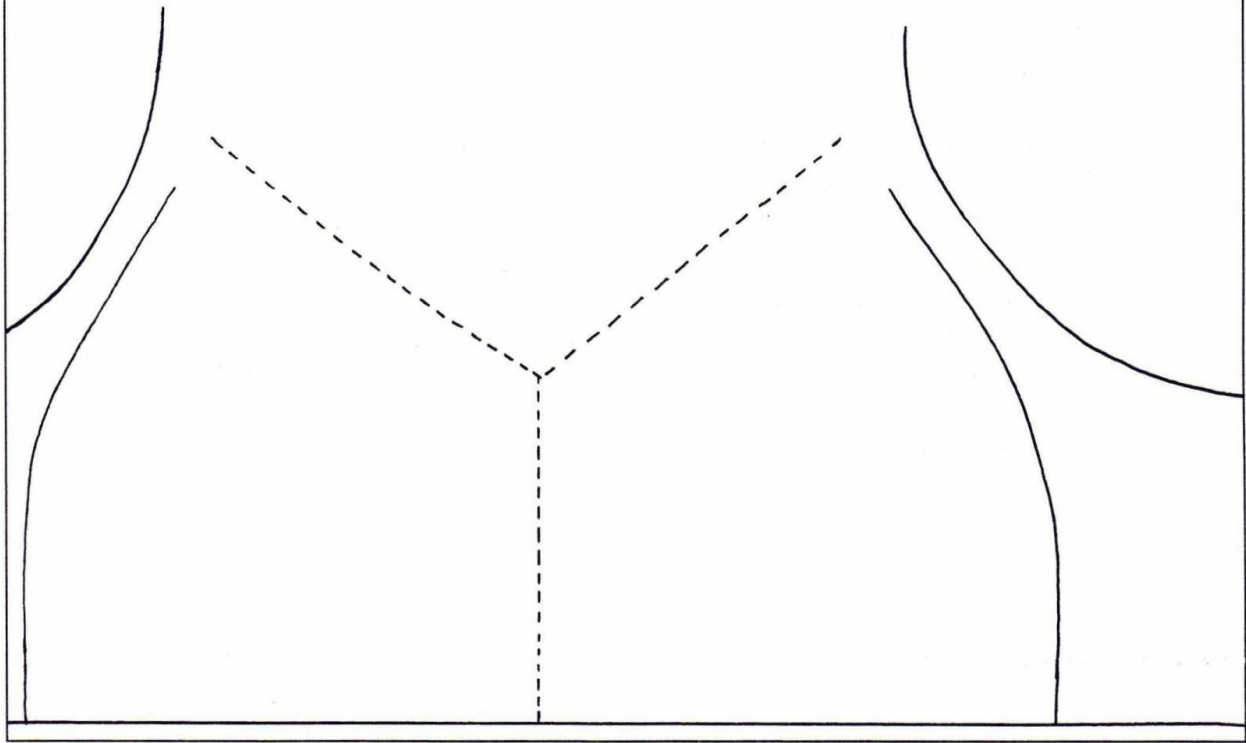
Again, using a felt-tipped pen, label each section of the bra with large capital letters: A,B,C,D,E,F etc.

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## ***STEP 3: SKETCH THE DESIGN OF THE BRA***



### 3b. THE NON-UNDERWIRED BRA THAT HAS A LONG SIDE SEAM



Before using one of these templates, you may wish to print/copy the template you will be using, so that the original template will be available for future use (visit [www.beautifulbras.com.au](http://www.beautifulbras.com.au) for downloadable versions of the templates). When using the template, neatly draw the seam lines and edges of your bra, and if they differ from the lines in the template, use liquid paper/correction fluid to delete the superfluous lines. Using a small-medium sized capital letter, positioned approximately in the middle of each section of your diagram, label each section of your bra (as in step 2).

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## Drafting the Pattern of the Bra Back

### **STEP 4: DRAFT THE PATTERN OF THE BRA BACK**

- ***Cut the left-body shoulder strap off the bra,*** (or fully extend its length). You will be drafting the pattern of the left-body-side bra

back.

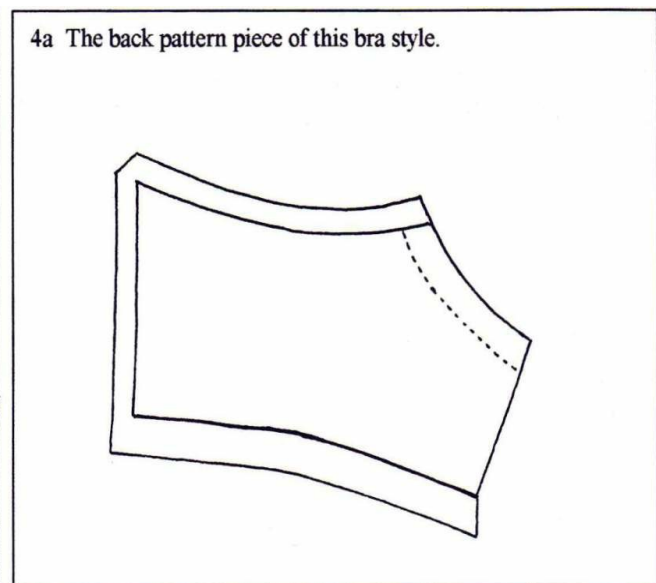
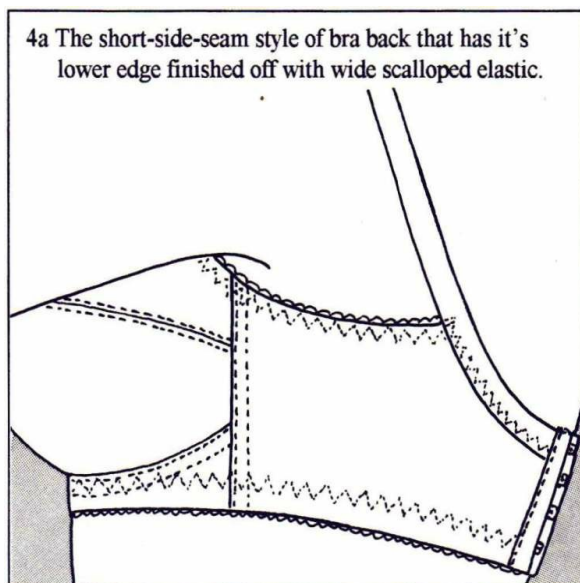
- ***Clip/cut through the upper and lower edge scalloped elastic*** (at close intervals) ***and iron the bra back with a warm/medium iron.***  
The bra back should be now able to lie flat. ***Place a piece of pattern making fabric over the bra back and pin it in position.***
- ***Trace:***
  - ***the side seam*** (that joins the bra back to the bra front)
  - ***the top, underarm edge of the bra back,***
  - ***the top edge of the strap that leads down to the closure,***
  - ***the closure edge*** (positioning the line just short of the base of the first bank of metal eyes: remembering that the flaps of the eye tab are wrapped around the raw edge).
  - ***lightly the lower edge of the bra back*** (use a line of dots).
- Remove the traced shape from the garment  
***Add an extra 1cm seam allowance to all edges and seam lines except for: the edge leading down to the closure, the closure edge itself, and the lower edge.***
- Using the principles on [pages 26, 27](#) and [28](#) ensure that the ***closure height*** will perfectly match your tab, and that the bra back is according to your requirements. Once the height and position of the closure edge have been determined ***the lower edge can be finally drawn.***
- ***Add the inner edge seam allowance below the lower edge line.*** This seam allowance should be ***the exact width of the lower edge scalloped elastic that will be used when the bra is sewn.*** Diagrams 4a and 4b.

***Note:***

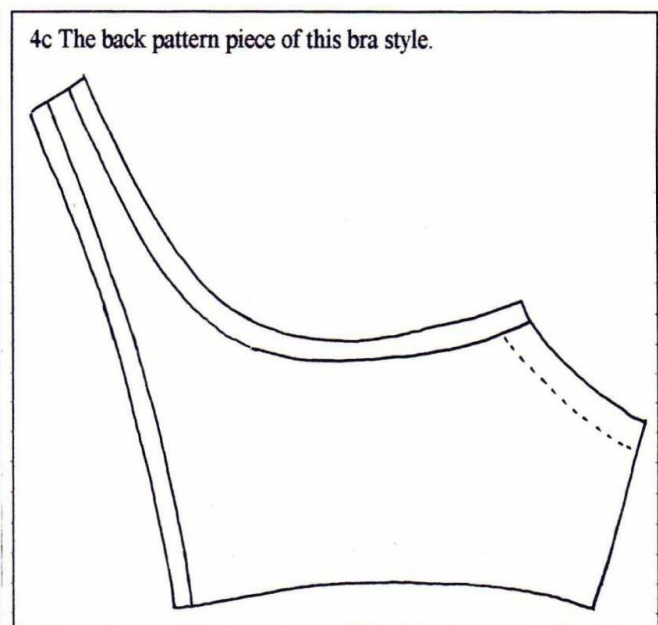
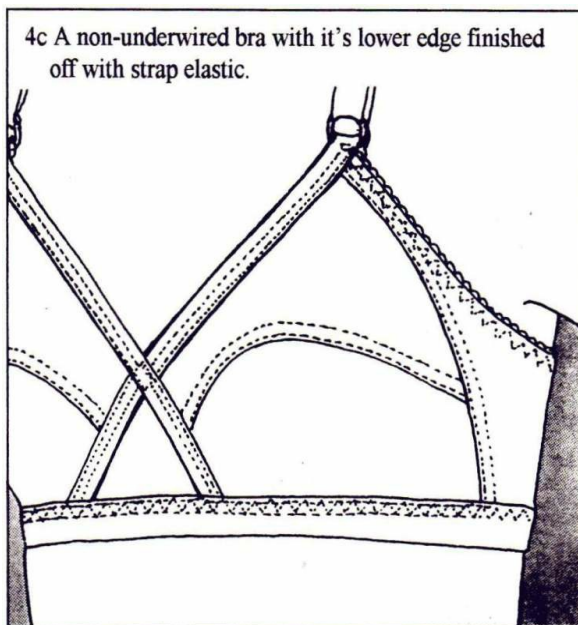
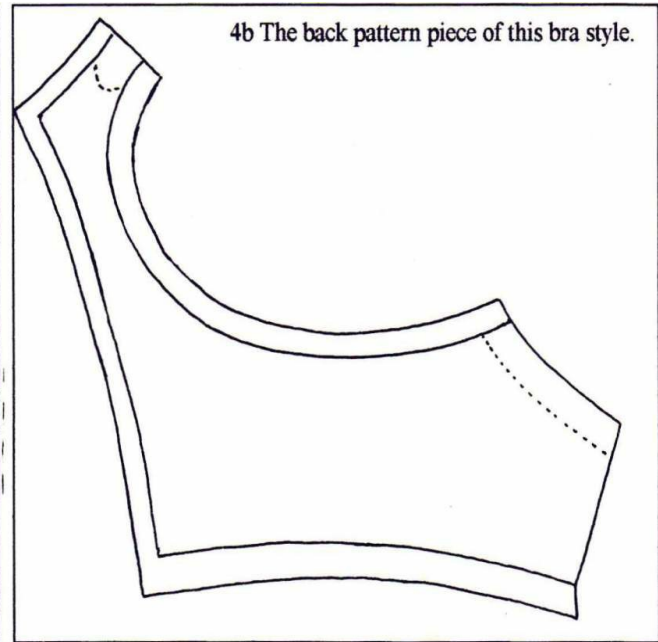
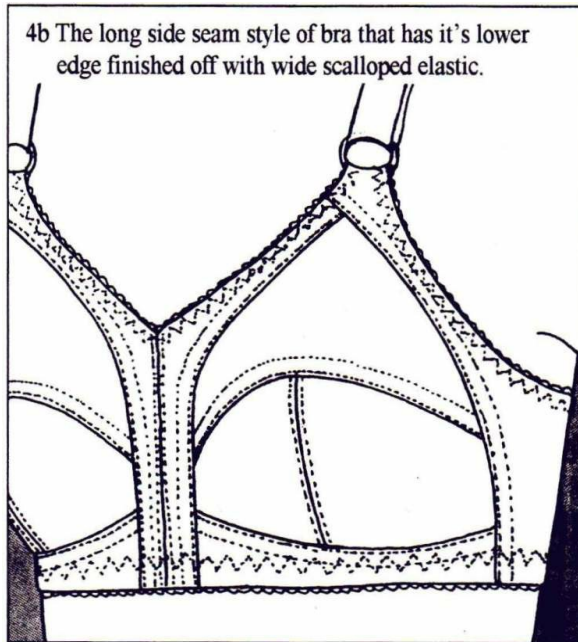
- If your bra's lower edge-finish consists of a length of shoulder strap elastic (diagram 4c), ***do not add any seam allowance along the lower edge of the bra*** (as there is no fabric that needs to be turned over and stitched down).
- Where strap elastic is sewn across the lower edge of a bra, the finished lower edge of the bra (the bottom edge of the strap elastic) becomes the cutting edge of the fabric (the bottom line on the pattern pieces that extend down to the lower edge of the bra).

- When new bras of this style are subsequently sewn, ***the bottom edge of the strapping is laid directly over the bottom cut edge of the fabric,*** the strapping and the bra are sewn together along the top edge of the strapping, and the excess fabric underneath the lower edge of the strapping is trimmed right back to the line of stitching.
- Thus, variations in the width of the strap elastic that is sewn to the lower edge (which may change from bra to bra), will never change the position of the bra's lower edge ... it will always be correctly positioned. The bottom edge of the original lower edge strap elastic becomes the bottom edge of the new bra's lower edge strap elastic.
- Note that this same principle applies to all the other pattern pieces that make up the bra's lower edge ... the very bottom edge of the bra's original strap elastic becomes the cut fabric edge over which the bottom edge of the new strap elastic is positioned.

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## Drafting the Pattern of the Bra Front

### **STEP 5: DRAFT THE PATTERNS OF THE PECES THAT MAKE UP THE BRA FRONT**

By now you will have drafted the pattern of your bra back and labelled it with all the relevant information according to the instructions given on [pages 26](#), [27](#) and [28](#). What now remains is to draft the patterns of the pieces

that together, make up the front of the bra.

Because of the vast number of non-under-wired bra styles, it is impossible to provide you with a single set of pattern making instructions that will apply to every style. ***However, the instructions and pattern making principles contained in [pages 33 to 37](#) (drafting and underwired cup's pattern) when carefully worked through, will help in drafting the front of your non-underwired bra.***

When working through these instructions, disregard any references to an underwire, and ensure that all seam allowances are 1cm except the lower edge seam allowance which should be the exact width of the lower edge scalloped elastic to be used when your new bra is sewn.

The same principles apply to both underwired and non-underwired bras ... the only difference is that with a non-underwired bra pattern you will probably have extra pieces around the cup ... pieces that take the place of the underwire in giving the bra structure. Some of these extra pieces you may have in your bra front are:

- ***The Centrepiece.*** As its name suggests, it is a piece of fabric that is positioned in between the cups.
- ***The Neckline Edge Piece.*** This is a piece of fabric that extends from the centre front of the bra and up along the neckline edge of each cup and is often made out of powernet or spandex. If this stretch-fabric neckline edge piece extends down in between the cups at the centre front of the bra, its lower half (the part going down between the cups) is often lined with a layer of rigid stabiliser. This piece of fine, strong, non- stretch lining fabric prevents the cups from stretching apart when the bra is worn.
- ***The Under-cup Piece/Band.*** As its name suggests, this is a piece of fabric that is positioned under the cups along the lower front edge of the bra. It is often made out of fabric that only has a slight give (if any). When drafting its pattern, ensure that the lower edge elastic across the front of the bra is cut through/clipped at close intervals, as the lower edge elastic often contracts the fabric in this part of the bra. If your bra style has an under-cup piece/band (that extends from one side seam across to the other side seam), then draw a

vertical line on it down the centre front of the bra. This line can be either a centre front fold line or a centre front seam ... whichever is easiest when it comes to formulating an order of sewing.

### **STEP 6: COMPLETE YOUR BRA'S STYLE DIAGRAM AND COLOUR-CODE THE ORDER OF SEWING**

When your pattern is fully drafted, complete the design sketch of your bra, using its ***left side to indicate the position of all the lines of stitching on your bra***, and the ***right side of your diagram to label all the sections of your bra and to colour code the seam lines and edges to be either hemmed or elasticised*** ([page 39](#)).

Should a set of sewing instructions for your particular style of non-underwired bra not be found in this book, you can formulate your own set of sewing instructions using the following principles and instructions.

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## Formulating the Sewing Instructions

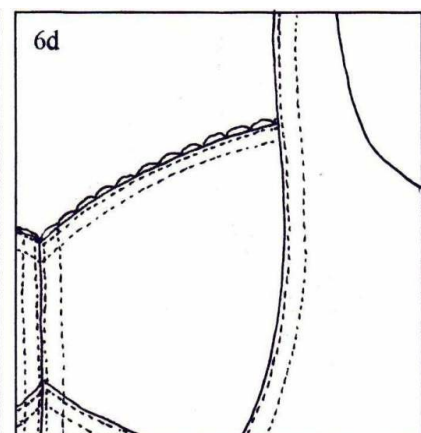
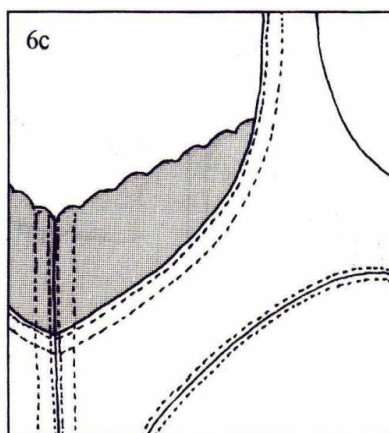
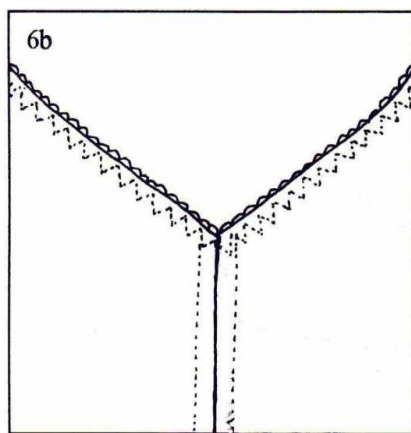
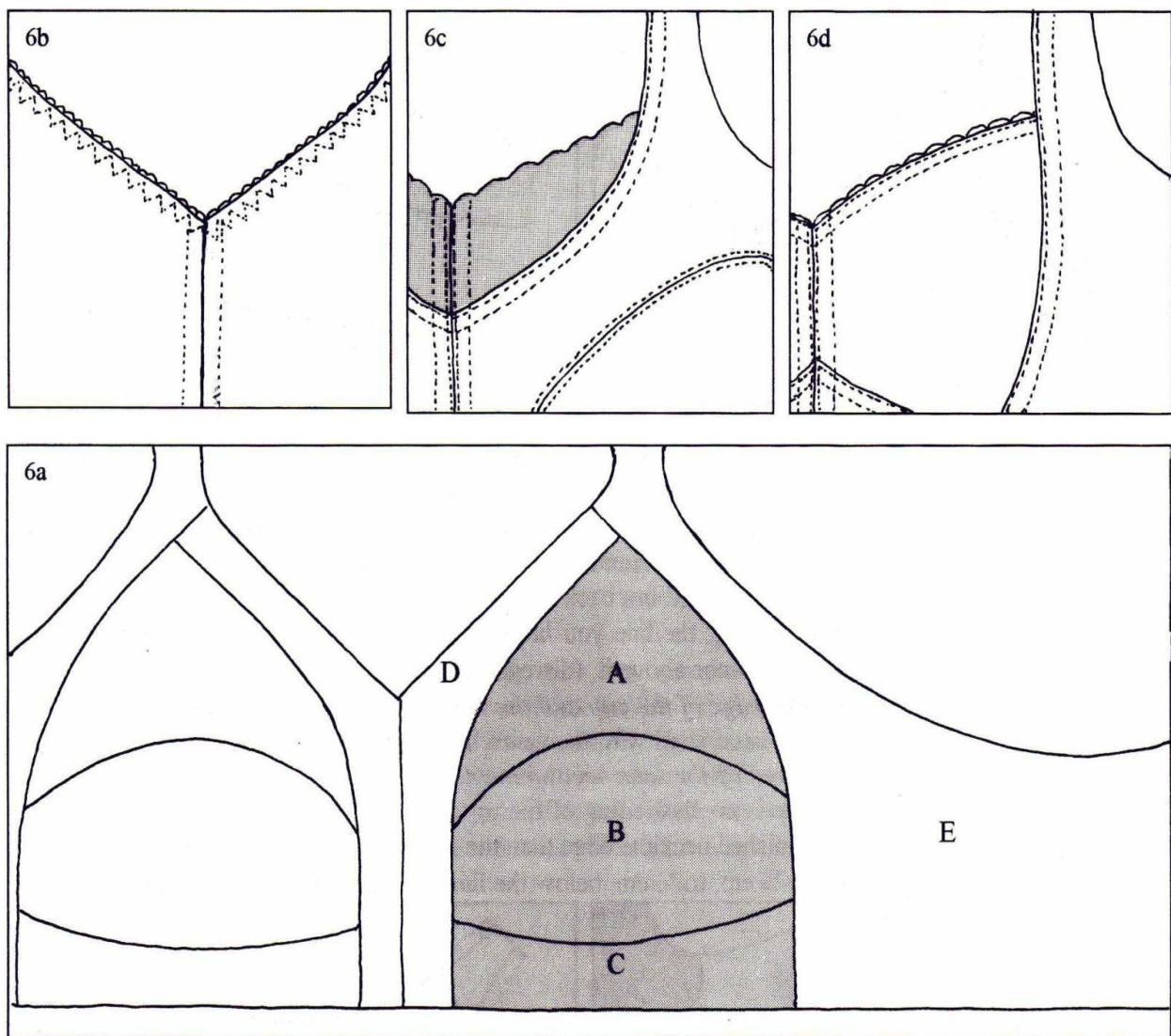
### **HOW TO FORMULATE SEWING INSTRUCTIONS FOR YOUR NON-UNDERWIRED BRA**

Should a set of sewing instructions for your particular style of non-underwired bra not be found in this book, you can formulate your own set of sewing instructions using the following strategies:

- ***Draw the design of your bra*** using clean, confidently drawn lines.
- ***Divide the bra up into its basic areas***. These basic areas will often have smaller sub-sections within them and must have straight lines (or slightly curved lines) as boundaries ... no angles or corners!
- ***The areas that are made up of smaller sub-sections must be sewn together first.***
- If your bra style contains two long seam lines and each one has a number of other shorter seams that join into it, along its length, it is quite easy to know which of the longer seam lines to sew first. ***The seam line that has the least of other seams joining into it is to be sewn first.***

In the example bra below in diagram 6a, there are three main areas: A/B/C, D, and E.

As the first section (A/B/C) is comprised of multiple pieces, it has to be sewn together first, before it can be joined to the rest of the bra. There are two long seam lines that join the cup section to the rest of the bra: the seam line that joins the cup to the neckline edge piece (D), and seam line that joins the bra front to the bra back (E). Of these two longer seam lines, the one that only has the ends of two seams joining into it along its length, must be sewn first (the seam that joins ABC to D).



- Where two finished edges meet at an angle, and neither edge is a

continuation on of a seam line, both edges have to be hemmed or elasticised before they are joined to each other. Diagram 6b.

- Where a finished neckline edge is joined part of the distance along a seam, the neckline edge seam allowance of the overhanging, higher cup piece becomes a hem. Diagram 6c and 6d.

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## SIMPLE PATTERN ALTERATIONS

### *Altering the Armhole and Neckline Edges*

#### **1. ALTERING THE ARMHOLE AND NECKLINE EDGE OF THE CUP**

If you happen to be ***short-waisted***, the bra cups may fit and support your breasts beautifully, but the bra may be so high in the underarm area that it cuts into the front of your armpit and the side underwire tip skewers you under the arm. The centre front neckline edge of the bra may also be far too high. The above aspects of the cup can be very easily corrected if they don't suit your body-shape.

***If the armhole edge is too high:*** draw a line on the bra to indicate the new lowered position of the whole finished armhole edge. The new side tip of the wire should be about 1½ to 2 cm. below the new, lowered finished underarm edge. Place a mark where you wish the new lowered side tip of the underwire to come to. Make sure the existing underwire is positioned within the channel of the casing as far around to the front of the bra as possible (push the side tip down as far as it will go). Take the bra off and measure with a ruler exactly how much lower the underwire tip has to be and make a note of that measurement. Fax or email (if you have a scanner) a tracing of the new required wire-shape to a bra haberdashery supplier so that the shape can be matched up and your order sent to you.

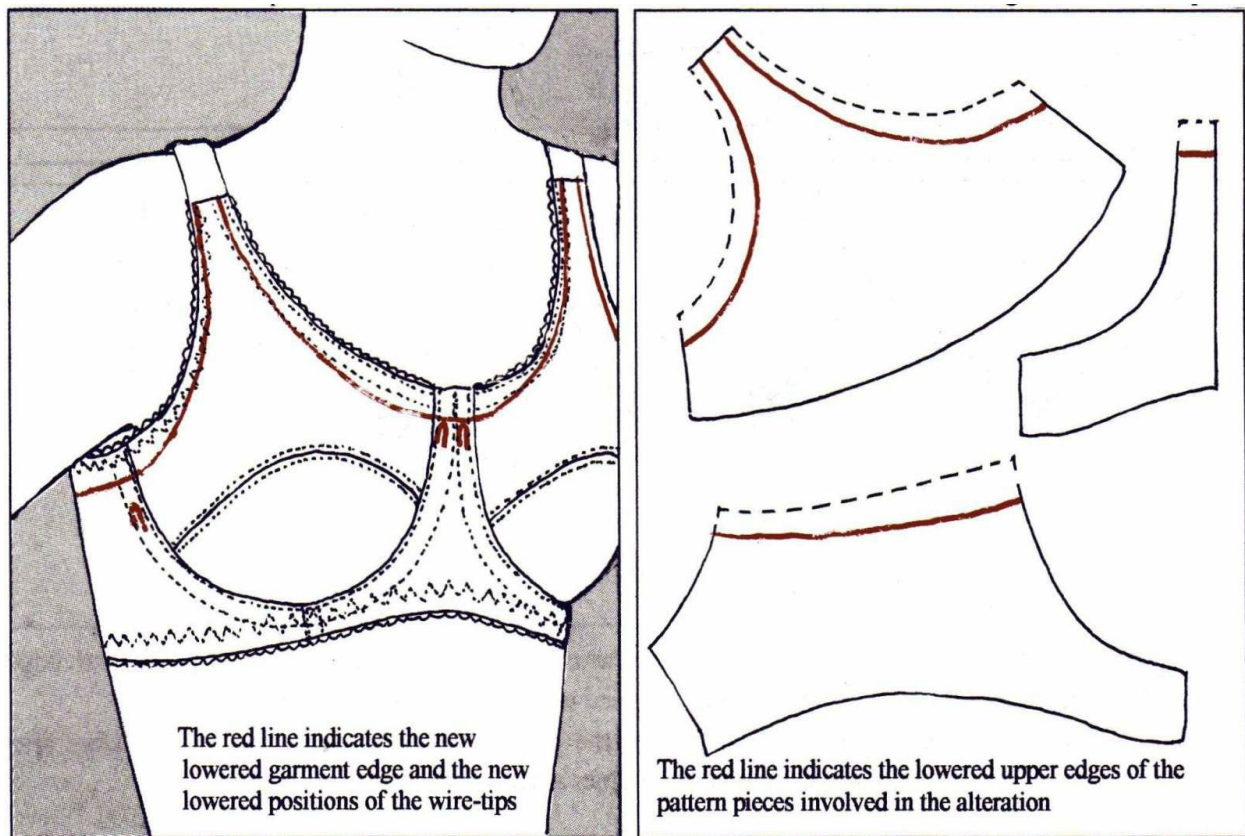
You will then cut the cup out of the bra to draft its pattern (cutting exactly along the wire line seam). Cut a hole in the casing and remove the wire that is too high, paying particular attention to which tip goes to the centre of the cup and which tip goes to the side of the cup. Trace its shape exactly, but lower its side tip according to your measurement.

When drafting the patterns of the bra cup and bra back 'scoop out' or lower,



the whole armhole edge on the appropriate pattern pieces, by tracing the line you have drawn indicating the new lowered armhole edge, and adding your own seam allowance above it. (disregarding the original armhole edge)

In a similar way the neckline edge of the cup and the centre front of the bra can be lowered. Remember that if the pattern pieces associated with the centre front neckline edge are to be lowered, the centre front wire tip has to be lowered by the same measurement. In an underwired bra, because there is no elasticising of the top edge of the centrepiece, the centre front wire tip can be a lot closer to the finished neckline edge than the side wire tip is to the armhole edge. The centre front wire tip should be  $\frac{1}{4}$  cm to  $\frac{1}{2}$  cm below the finished centre front edge of the bra cup.

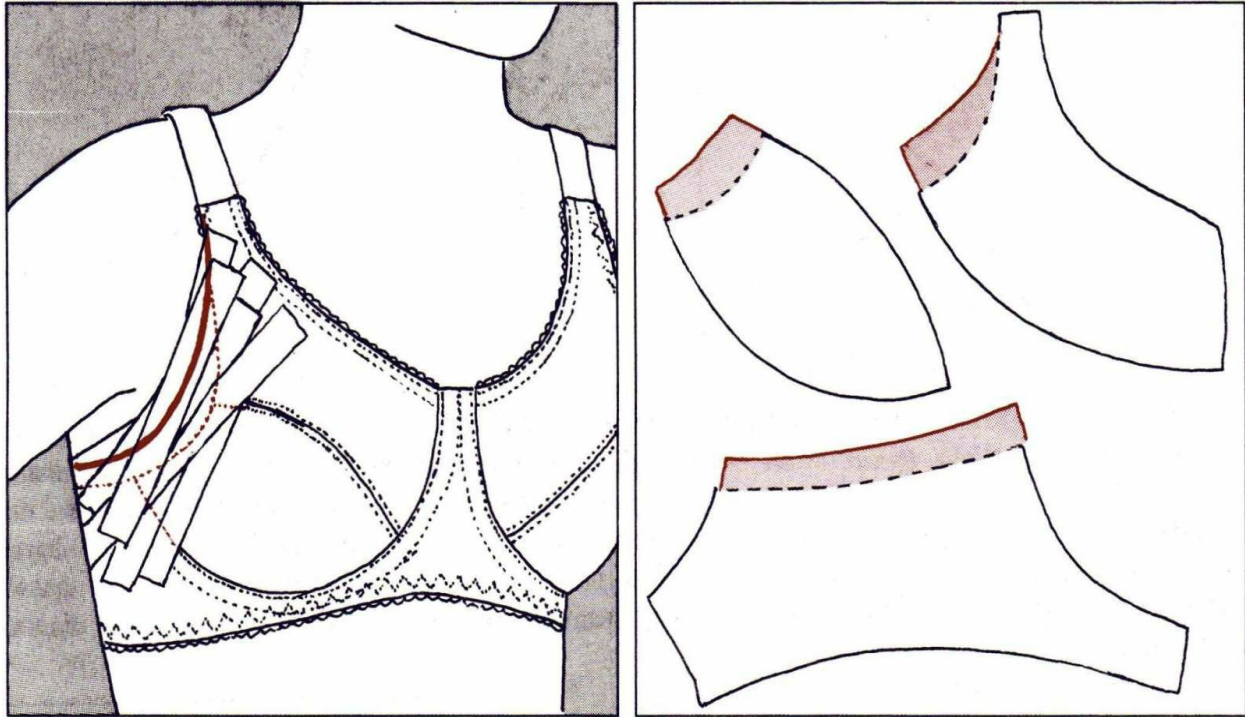


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***Alternatively if you are long-waisted, you may wish to make part, or all of the armhole edge higher.*** If this is the case, when you have the bra on, place overlapped strips of 'micro-pore' bandaging tape over the bra's existing armhole edge, as well as over the new area to be covered. A new higher

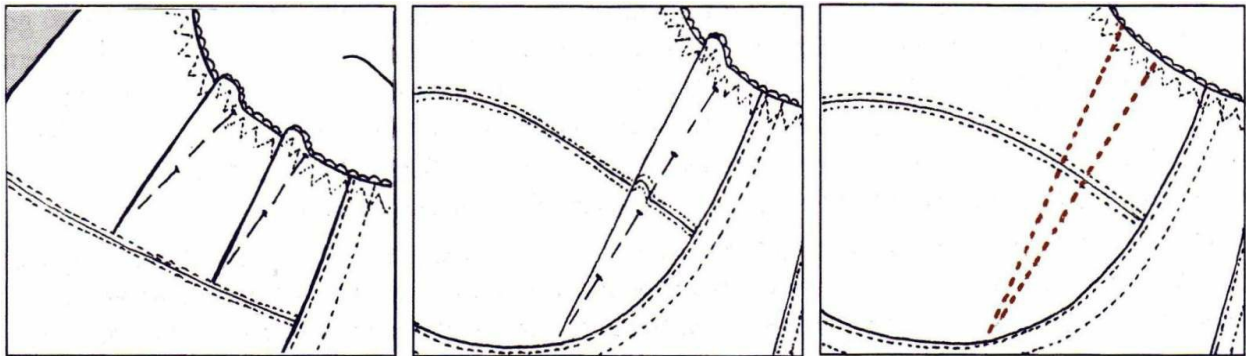


armhole edge can be drawn onto the taped area. The bra can be carefully peeled off, the existing seam lines can be extended onto the micro-pore using a felt-tipped pen, your bra can be cut up along those seam lines, the sections traced and the seam allowances added.



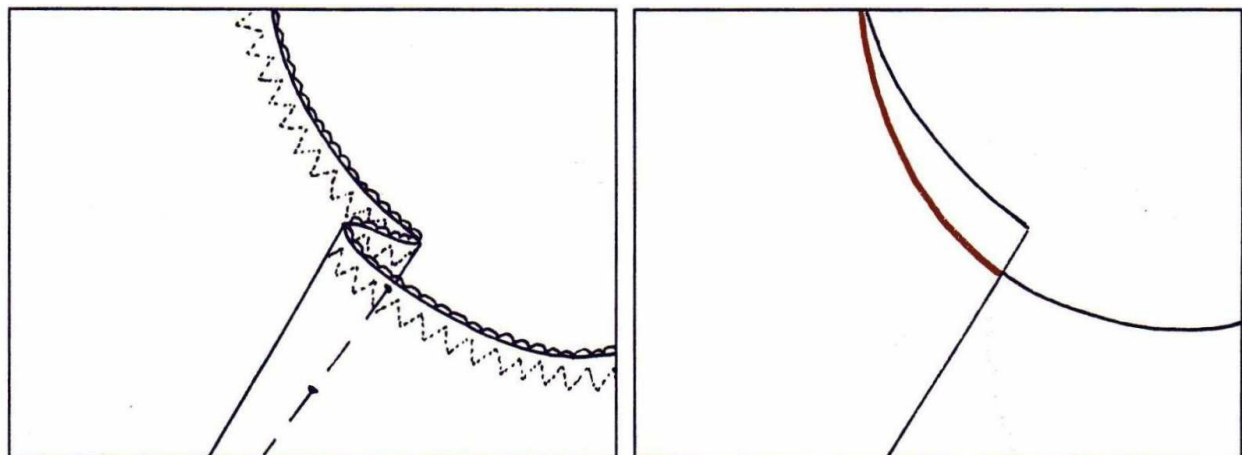
***If the armhole edge gapes at the side of the upper cup***, it is best to build a snug fit into the cup pattern itself instead of merely relying on the armhole edge elastic to gather the edge in for you. This is because, however good the quality of the armhole edge elastic, there will come a time when it fatigues with wear, and the armhole edge will gape again. To properly rectify this problem, pin a dart or two into the side of the upper cup when the bra is being worn. Hopefully only one small-to-medium-sized dart will be needed to eliminate the gaping, but if the dart is a large one, two smaller darts should be pinned into the armhole in preference to one huge dart. The pinned dart should extend from the finished armhole edge right to a cup seam line (where it disappears). Diagram below left. If the dart needs to be extended downwards into the lower cup area (diagram below centre), then the dart should finish at a seam line. Finishing a dart at a seam line ensures that the pattern pieces will still sit flat. The guiding principle is: ***whatever you do to the cup to improve its fit, do exactly the same to the cup pattern***

**pieces.** The bra is taken off the body and the pin lines (the points at which the pins were inserted through the cup fabric) are drawn onto the cup itself, using a water-soluble felt-tipped pen. The pins are removed (diagram below right). When the bra's original cup pattern is drafted, the pin lines are also traced onto the pattern. The pattern is then darted in exactly the same way as was the original cup (using pins with small heads on them so that they aren't bulky), the pattern is flattened and re-traced onto a new piece of tracing fabric, producing the corrected cup pattern.



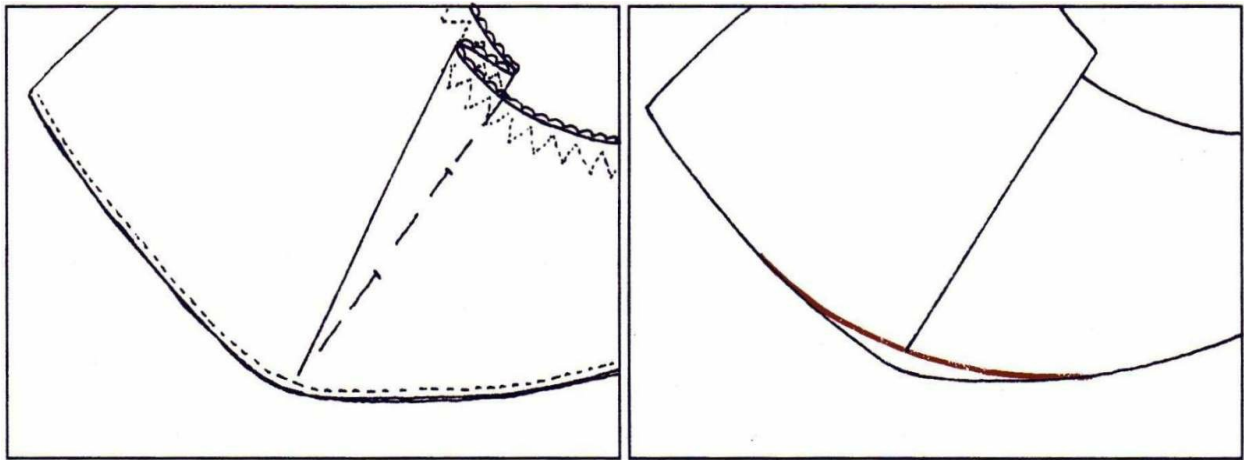
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**When the corrected cup pattern piece(s) is being drawn,** it may be necessary **to re-draw the finished armhole edge**, as the base of the dart will have split the line of the armhole edge. Diagram below left. To correct this split, join the lower section of the finished armhole edge up to the top of the armhole edge, disregarding the overhanging middle section. The new armhole edge is indicated by the red line in the diagram below right.



If your dart only affected the upper cup, and did not descend into the lower

cup region, you may also have **to reduce any slight 'bump' in the curve of the mid cup seam line** that was produced by the dart. If such a 'bump' was formed, it will have arisen on the seam line at the point of the dart (where the dart dwindled away to nothing) and was caused by the sudden change in direction of the seam line. Diagram below left. If the dart has produced such a 'bump' in the seam line, simply 'shave off' its top, so that the seam line is smooth again. The corrected mid cup seam line is indicated by the red line in the diagram below right.



**If the armhole edge gapes under the arm**, this is very easily corrected.

The previous method corrects any gaping at the side of the upper cup, at the front of the armhole edge, but often the rest of the armhole edge (under the arm and along the top edge of the bra back) needs to be tightened up as well. Refer to [page 60](#) and [61](#) for additional pattern making information. A loose underarm edge is often produced when the bra back has been self-lined to produce a longer-lasting garment, and the shape of the bra back from the manufactured bra has been retained and lengthened. Self-lining the bra back often highlights the inadequacies of the manufacturer's pattern design. **The reason why the original bra back didn't gape was because the bra back fabric was stretched to its maximum in order to go around the ribcage, disguising any design faults in the shape of the pattern pieces.**

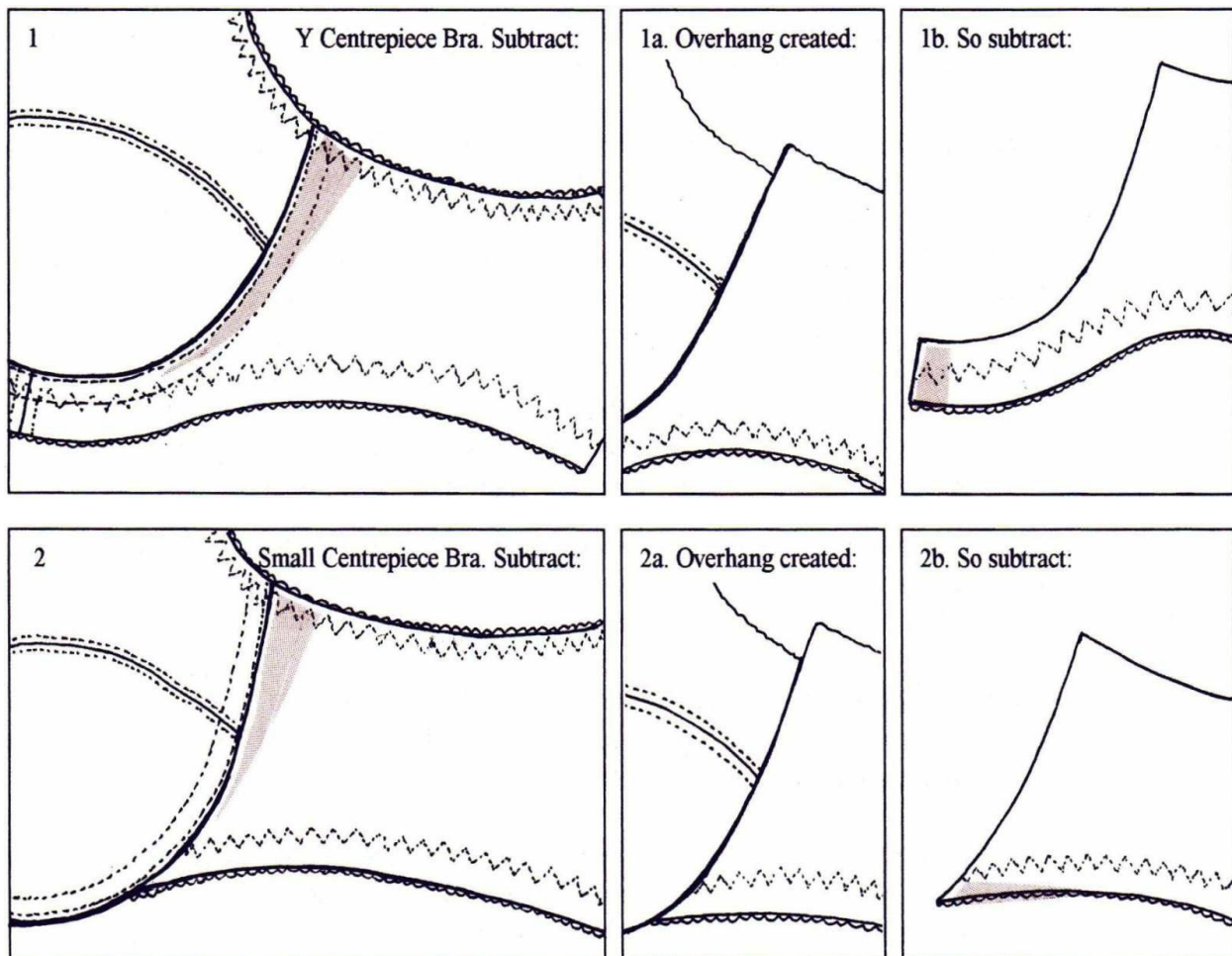
Darting the pattern pieces in a similar way to that previously described, with the dart extending vertically from the armhole edge (directly under the arm) right down to the lower edge of the bra back is always an option, but this is not my preferred option. Instead, **I prefer to change the shape of the pattern pieces in this region, using the seam lines and the edges of the**

**pattern pieces already present.**

**If the bra is a Y centrepiece or small centrepiece style**, shave a wedge off the bra back fabric. Diagram 1a and 2a. Subtracting this area alone may make the bra back's wire line seam too long, causing the bra back to overhang the cup in the underarm region (at the top of the wire line seam) when the bra is constructed.

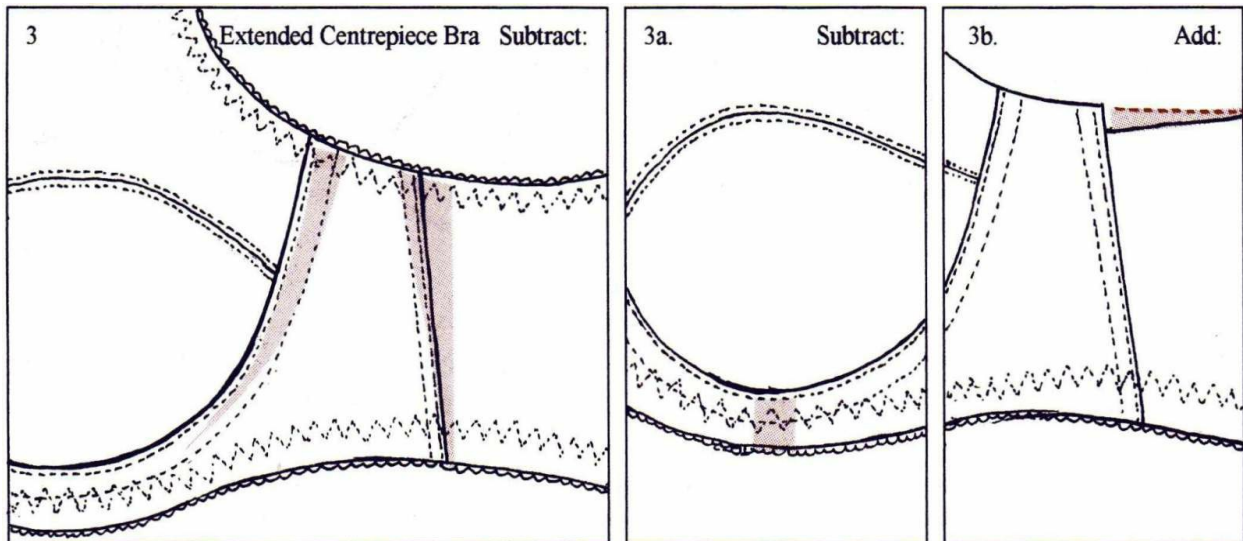
[page 47]

Measure the lengths of the wire line seam on both the cup and the bra body, and if this has occurred, subtract a section from the bra back pattern piece that is situated directly under the cup space. Diagram 1b. The length of the area to be subtracted under the cup will depend on the size of the discrepancy in the wire line seam length. If your bra is a **small centrepiece style** to correct this, subtract a wedge from the lower edge of the bra back as it approaches the side of the cup. Diagram 2b.





***If the bra is an extended centrepiece style, subtract the necessary fabric from the area adjoining the cup and/or the side seam*** (shaving small wedges off the bra back and/or centrepiece patterns). Diagram below left. As is the case in the above two styles, subtracting area at the side of the wire line seam may make the wire line seam on the centrepiece pattern too long for that of the cup. To correct this, subtract a section from the centrepiece pattern: situated directly under the cup space. Diagram 3a. Altering the side seam may also make the side seam on the centrepiece pattern too long, so a new top edge (which is a continuation on of the higher section of the edge) may be drawn so that the side seam on each pattern piece is the same length. Diagram 3b.



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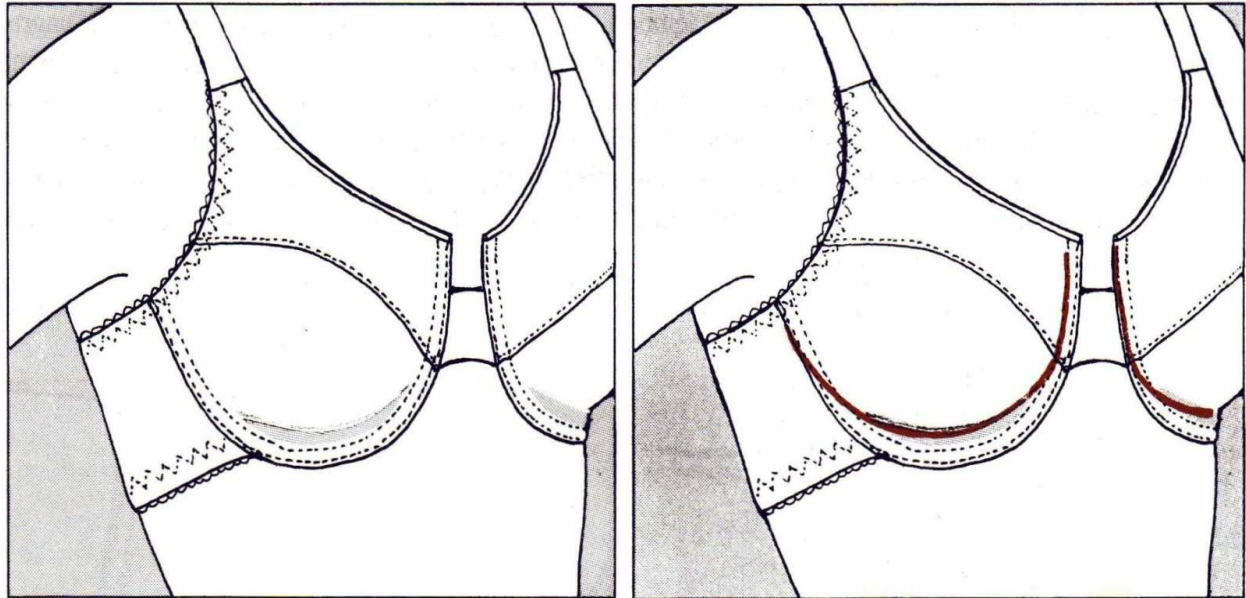
## Altering the Shape of the Underwire

### 2. ALTERING THE SHAPE OF THE UNDERWIRE

***When a properly fitting underwired bra is worn, the underwire should not be felt.*** If you are accustomed to wearing underwired bras, and you are constantly aware of the wire being there, then the shape/size of the underwire needs to be changed. Firstly, make sure that it is the underwire that needs altering and not something else. Many ladies believe that if the underwires poke out at the centre front of their bra, then that particular size or shape of underwire is to blame. This isn't the case at all.

- ***If the wires poke out at the centre front of the bra***, this generally indicates that the cups are too small and/or too shallow in shape to accommodate the fullness of the breasts i.e. this indicates a cup problem, not an underwire problem, and you should try the same bra on in a larger/fuller cup size e.g. Try on a DD fitting in that particular bra instead of a D fitting. If the available cup space is sufficient to enable the fullness of the breasts to go down and out into the cups, the wires will sit in very close to the sternum (your ribcage). A common example of this problem occurring is in minimiser bras. Minimiser bras are deliberately designed to have a shallow shaped cup in order to press the fullness of the breasts firmly against the ribcage to reduce the bust projection. Because of the way minimiser cups 'bind' the breasts, their wires almost always poke out at the centre front. This can't be overcome if the bra is to continue being a minimiser, as this inadequacy is caused by the very nature of a minimiser bra. If the cups do fit and support your breasts beautifully, but the shape of the underwire doesn't suit the shape of your body, this can be easily altered. While you are wearing the bra, you can make the following underwire alterations. Here are some common underwire problems and their solutions.
- ***If the underwires bruise your rib cage right under the breasts***, then this can be simply corrected by shaving off a bit of depth from the bottom edge of the lower cup: this should hold the wire slightly away from the chest, stopping it from pressing in so heavily.
- ***If the underwires are sitting down on the front of the chest, and there is a noticeable gap under the cup between the wire and body's wire line crease (where breast joins to the ribcage), the wire is too deep in shape. Diagram below left. A more suitable wire shape would be shallower, similar to a flat-bottomed boat.*** The better shaped wire is indicated by the red line in the below right diagram.





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When the bra is being worn, a line should be drawn onto one of cups by running a felt-tipped pen along the wire line crease under the breast. If the bra is black or dark in colour, I use a 'liquid paper' correction pen to draw a line of white dots instead. This line will indicate both the outer margin of the breast and the new, shallower shape of the underwire required if the bra cup is to suit your body-shape. The bra is taken off, laid flat with the right side of the garment facing upwards, and the cup fabric positioned in such a way that the under-cup and the line drawn on it is clearly visible. A piece of 'Do-Sew' (a semi-transparent pattern making fabric) is then pinned to the cup and the new required, underwire shape is traced. You should be able to 'feel' where the wire in the bra is and where its tips are, and you should be able to trace the centre front and side uprights, but instead of following the deepest, lowest part of the wire's U-shape, follow the line you have drawn on the bra instead. This shape can be faxed or emailed to a bra haberdashery supplier.

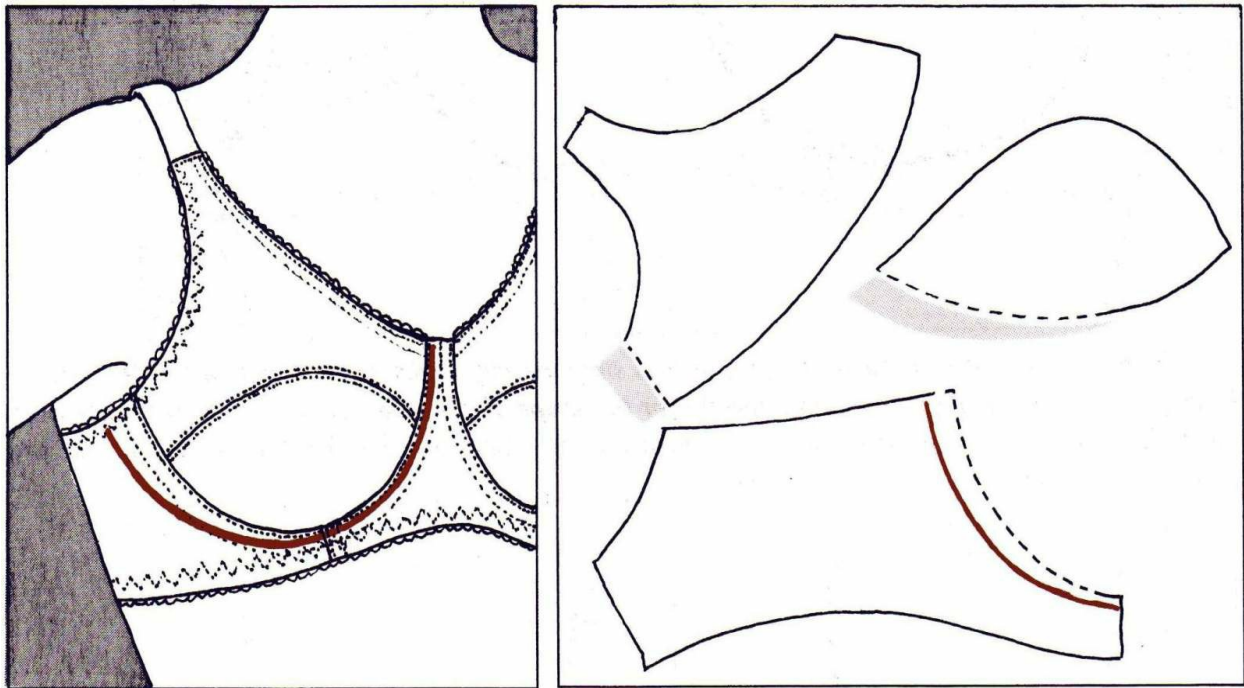
When your wire shape has been matched up as closely as possible, and your new wires sent back to you, lay the new wire on the cup in its correct finished position. Using a fine point felt-tipped pen, draw the final wire shape onto the cup, tracing around it.

The **inside edge of the wire** becomes the wire line seam if the raw edges around the cup are to be turned **out of the cup** to be top stitched down, and

the ***outside edge of the wire*** becomes the wire line seam if the raw edges around the cup are to be flipped ***into the cup*** to be top stitched down. When drafting the cup pattern incorporating a new wire that is simply ***shallower*** under the cup, ***shave off an appropriate amount of cup fabric from the bottom edge of the lower cup.***

- ***If the side uprights of the underwires catch on the inside of the upper arm, this indicates that the side upright is sitting on breast tissue and is positioned too far forward on the body.***

If the underwire shape is too deep of a U, and its cup does not have sufficient horizontal coverage on the body, the side underwire upright will be sitting over breast tissue when the bra is worn. Because of this, it will not be able to sit in properly against the rib cage, and the underarm wire tip will continually catch on the inside of the upper arm.



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In this case, the side upright of the underwire should ideally be positioned further towards the back of the body, behind the breast tissue, where it can sit in flat against the ribcage (diagram above left).

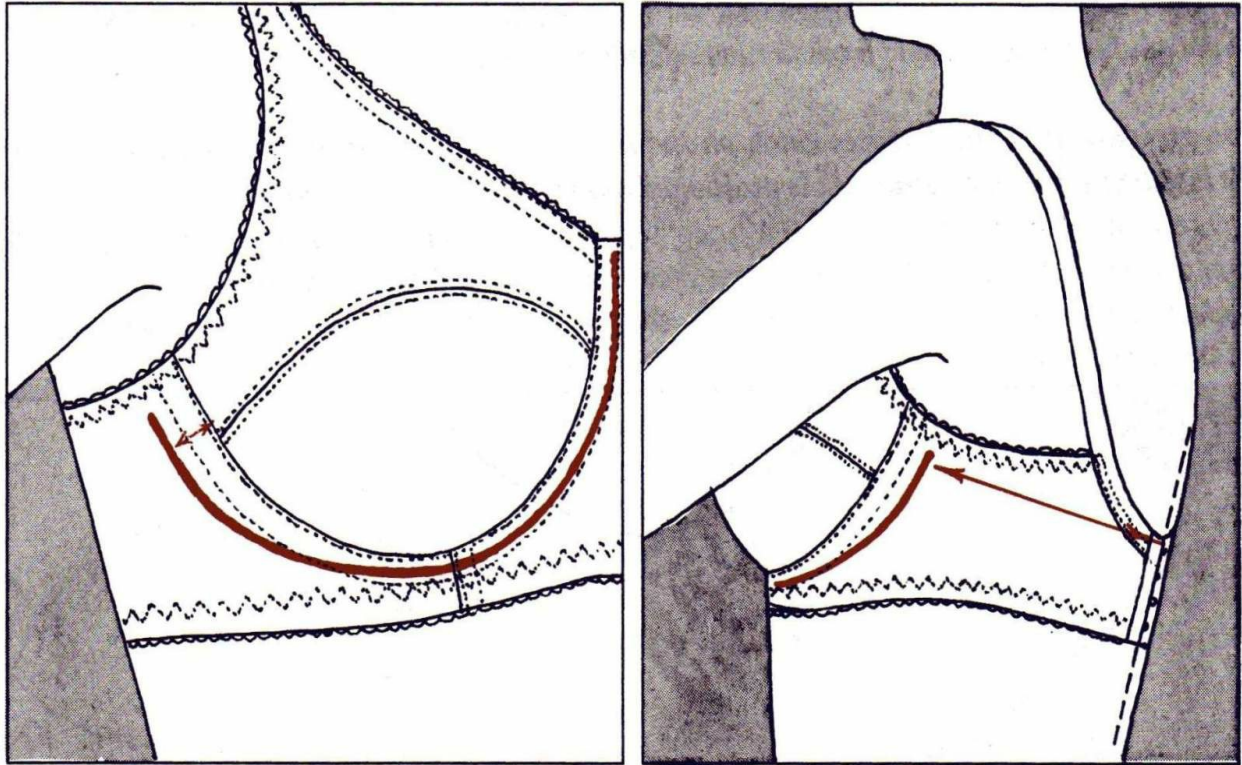
Thus, the wire needs to be a wider U-shape, again similar to the shape of a

wide, flat-bottomed boat, with the side of the cup and its wire line seam (where the cup joins onto the bra body) extended back accordingly as in the diagram above right. Be aware that as you are going to add extra length to the side of the cup, the length of the bra back of the bra will have to be reduced accordingly.

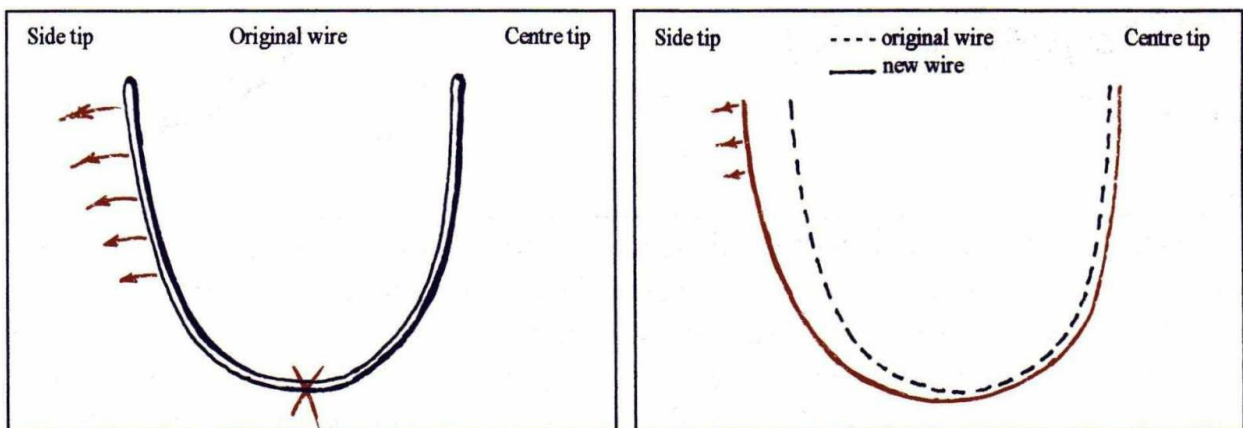
If the wire needs to be wider at the side of the cup, when you are wearing the bra, enlist the help of a friend to draw onto the bra with a felt-tipped pen. ***The side upright of a new, wider wire shape that sits over the side margin of the breast or slightly behind it should be drawn onto the bra. You will know where the breast tissue ends by using your thumb to gently press in.*** Beginning at the side of the breast, when your thumb is pressing into breast tissue, the sensation is definitely uncomfortable, but moving your thumb further back, bit by bit, there is a point beyond which you are only pressing into fat over ribcage. That is where the wire's side upright should ideally be positioned: the point at which the breast tissue ends and the thin layer of fat tissue over ribcage begins. The new position of the side tip should also be marked onto this new wire line ... it should be 1½ to 2 cm below the underarm edge.

If the bra has a non-stretch extended centrepiece, the line will be drawn on non-stretch fabric at the side of the cup and is a stable indication of the new wire shape. If the centrepiece is not an extended one that wraps under and right around the side of each cup, the line will undoubtedly be drawn on the stretched powernet or spandex fabric of the bra back. If this is the case, while the bra is on, measure the distance between the position of the new wire's side tip and the original wire- line seam. When the bra is taken off the body, and the stretch fabric has contracted into its relaxed state, you will then know just how much wider the new wire shape (and the side of the cup) has to be.

Also measure the distance between the new wire's side tip and the centre back of the body, as this measurement will be needed when drafting the pattern of the bra back.



- If the underwires of your favourite bra, always snap directly under the cup, this indicates that the U-shape of the wire is too narrow and upright for the shape of your ribcage. Each time the bra is worn the uprights of the wire are forced to splay or bend apart too much, causing the metal wire to fatigue and break at the half-way point: directly under the cup.



The solution to this problem is to choose a slightly wider, more broadly-based U-shaped underwire. This wider shaped wire won't have to flex apart so much on the body and therefore it will not break. The side of the cup will

have to be extended further back according to the new wire shape and an appropriate amount of space will have to be subtracted from the bra back. Again, the new wire shape will be rather like a flat-bottomed boat and all the former pattern making instructions apply.

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## Altering Cup Volume

### **3. ALTERING CUP VOLUME**

Altering cup volume can be very difficult, and small changes to the cup pattern can produce quite significant changes to the resulting cup, so when making changes to the cup volume, it is best to go cautiously, making smaller alterations at a time rather than huge changes.

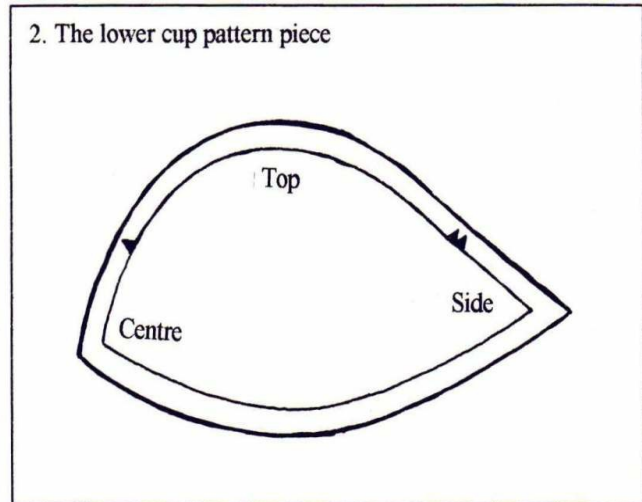
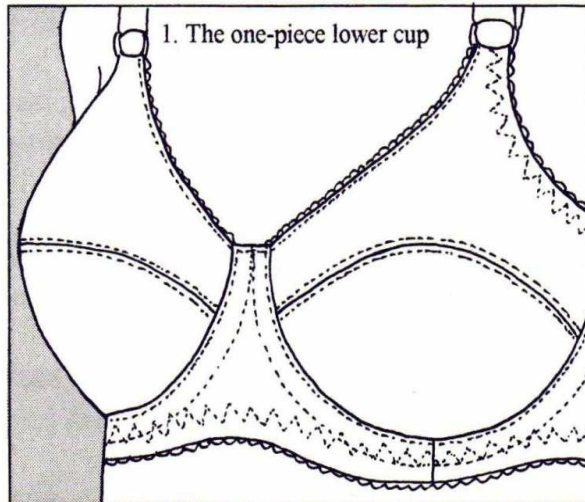
## Decreasing Cup Volume

### **DECREASING THE CUP VOLUME**

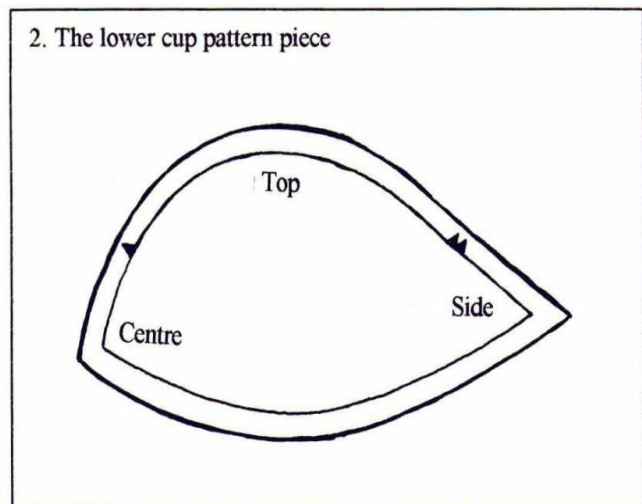
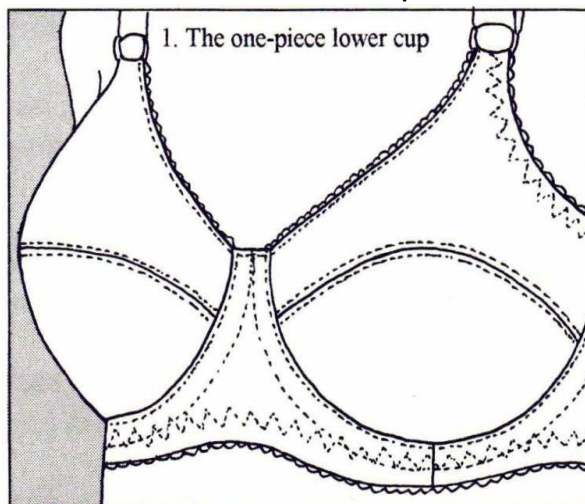
If I have a choice between choosing a cup that is a bit too small and one that is a bit too big to draft a cup pattern from, I would prefer to use the cup that is a bit too big, as it has greater pattern making potential. I can pin darts into the cup to subtract cup volume and work from there, but concerning the cup that is too small, it is very difficult to know with accuracy, just how much fuller to make the cup. Most of the following methods for decreasing cup volume, can be used individually, or selectively, in combination with each other.

- If the cup volume is just a fraction too big (about a quarter of a cup size or less), as a general rule I tend to subtract horizontal cup space from the side of the cup the area of the cup between the nipple and the underarm region. This will ensure that the side of the cup is taut/flat, causing the breasts 'face towards the front' of the body. This can best be achieved by 'pinching in' the horizontal cup seam line that extends into the side area of the cup (diagram below left).





- If the cup volume is between quarter and half a cup size too big, then dart both the upper and lower cups equally, using one vertical dart in the middle of the cup, or two darts equally spaced across the cup. Diagram above right. Note: Never just dart the upper cup alone, as this reduces uplift!



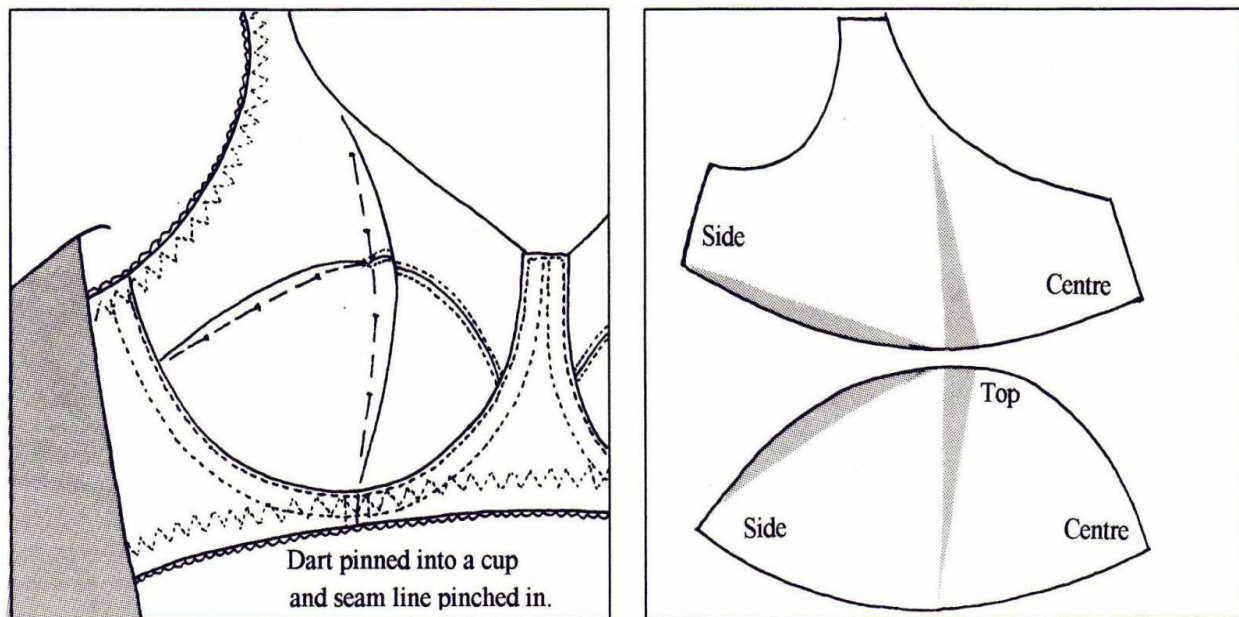
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Note: Darting the cup pattern can make the central horizontal cup seam line of the one of the cup pieces slightly longer than that of the other. A line of easing stitches can be used to contract the longer seam line, and these easing stitches should be marked on the appropriate pattern piece. When new bras are sewn, a line of easing stitches (an extremely long straight stitch) can be sewn right on the upper cup's seam line, 1cm in from the raw fabric edge and positioned from the side of the nipple area in to the centre



front of the piece. The bobbin thread should be pulled taut (slightly tight) to 'grab' the seam line in and make it the same length as that of the other cup piece. A seam line length discrepancy of up to 1½ cm on a medium sized cup can be gently and invisibly overcome in this way. This easing-in of one, or both seam lines also helps to give the tip of the cup a less pointy, more rounded appearance (when the figure is viewed in profile). Care must be taken not to produce gathering however, as gathering will produce unsightly puckering at the nipple area.

- ***If the cup is slightly too big, another option is to combine subtracting side cup space with darting the cup.*** Pinching in the mid cup seam from the nipple to the underarm will tighten and flatten the side of the cup, forcing the breasts to 'face towards the front.' Darting the cup pattern will also further reduce cup volume. Diagram below left. The shaded area shows the area subtracted from the pattern pieces. Diagram below right.



***The way that darts are inserted into a cup can affect not only uplift but affect the amount of breast separation that a cup provides.***

When introducing darts across the cup, it is advisable to understand the way in which dart placement will affect the cup shape and the amount of separation/distance between the breasts.

- ***If only the inner cup area of both cups is darted***, (the horizontal distance across the cups between the nipple area and the centre front of the bra) the net result is to decrease separation between the breasts, or move the fullness of the breasts closer together.
- ***If only the outer/side cup area of both cups is darted***, (the horizontal distance across the cups from the nipple area to the underarm area) the net result is to ***increase the separation*** of the breasts, or move the fullness of the breasts further apart.
- ***If both the inner and outer cup areas are equally darted, the separation produced by the original cup will remain unchanged.***

[page 53]

***When darting a cup, care must be taken to extend the dart from one seam line all the way across to another seam line on the other side of the cup piece.*** If the point of the dart (where the darted fabric tapers away) is positioned in the central area of a cup piece, it will be impossible to obtain a flat, two- dimensional pattern piece. In this case, there will have to be a dart marked onto the pattern and the dart will always have to be sewn into the cup fabric when the bra is sewn. Having a darted cup like this is not exactly 'standard operating procedure', as far as bra making goes, but as you will be the one making and wearing your bras, you are free to make them as you wish, and no-one has the right to impose arbitrary rules on your sewing.

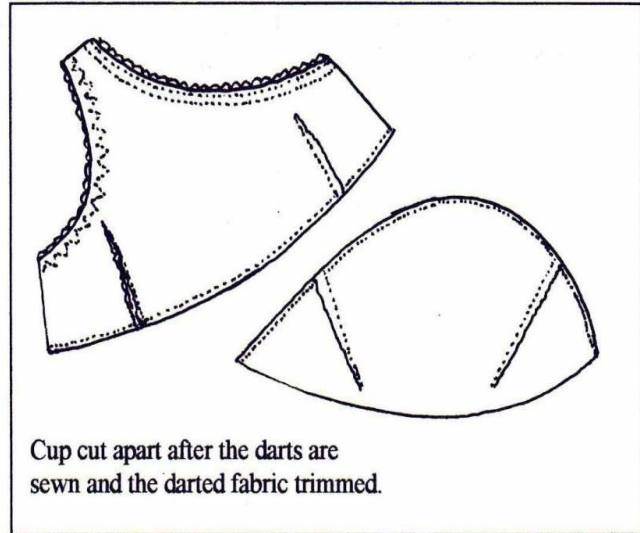
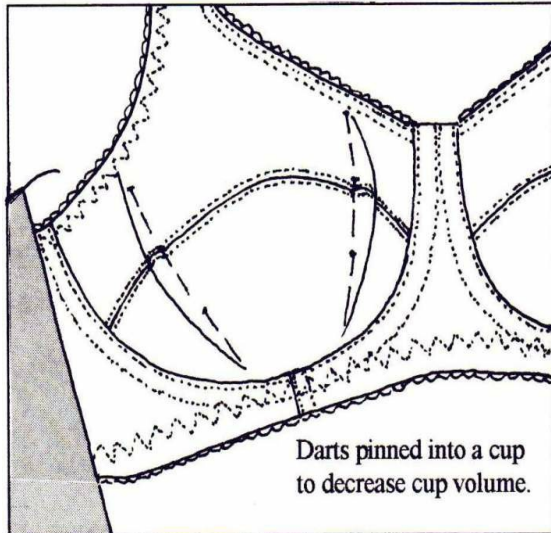
***The size, and position of the darts that are pinned into the cup fabric at the fitting will be identical to the way the bra's cup pattern is to be darted.***

Once darts are pinned into the cups at the fitting and the bra is taken off the body, the darts can either be drawn onto the cup fabric, traced onto the bra's cup pattern, the darts re-pinned in the pattern, and then the darted pattern traced afresh. This basic method is outlined on [page 45](#).

***An alternative method is very useful if there is more than one dart in each cup, and altering the pattern will be quite complicated:***

The bra is taken off the body, with the dart (or darts) remaining pinned into the cups. One cup is cut out of the bra along the wire line seam. The darts are then sewn (with the darted fabric on the outside or right side of the garment), and the darted fabric trimmed back very close to the stitching of

the dart. The cup can be cut up into its sections along seam lines, the pieces ironed with a warm iron, and traced, with the seam allowances finally added to complete the pattern.



- There is one other option that can be used in reducing the cup volume, and that is ***to use cup fabric or lace that contains less stretch or give than that used in the original cup.*** This is not an option I freely use however, as I find that I have less control over the reduction process and the results cannot be as accurately controlled as when using the other methods previously outlined. If you would like to try this method, then I suggest that you 'tighten up' the lower cup area first. This will produce greater uplift, and perhaps produce a sufficient reduction in cup volume. I prefer to retain some stretch or give in the upper cup area, with the greatest stretch or give running across the upper cup, parallel to the neckline edge. This will ensure that the neckline edge never pulls tight, creating unsightly bulging. As always, it is best to make small, cautious changes, one at a time rather than huge alterations. It is safest to alter the stretchability of the fabric within the cup, one cup piece at a time, only slightly reducing the stretchability of each cup piece, until you have the stretchability mix just right.

[page 54]

## Slightly Increasing Cup Volume

## **1. SLIGHTLY INCREASNG INNER CUP VOLUME**

***If the cup volume is a bit too small*** (up to quarter of a cup size), ***I tend to slightly increase the inner cup's volume***: this is the area of the cup between the nipple and the centre front. I often choose to increase the cup volume in the inner cup region because:

- ***I have found that many underwired and non-underwired cup styles, have insufficient cup volume/space in the inner cup region.***

Many women are very full-breasted close to the cleavage, and while the outer cup region (between the nipple and the underarm region) often contains sufficient cup volume, the inner cup volume is quite inadequate, causing the centre front tips of the underwires to protrude.

- ***The inner cup region is the perfect place to add cup volume, as it is beautifully concealed under our clothes.***

The blouses and tops that we wear, tend to lie fairly flat in between the nipples, sitting out from our ribcage, giving the bra maker/designer a concealed space to utilise, thus making it possible to increase the cup volume without visually making the bustline larger.

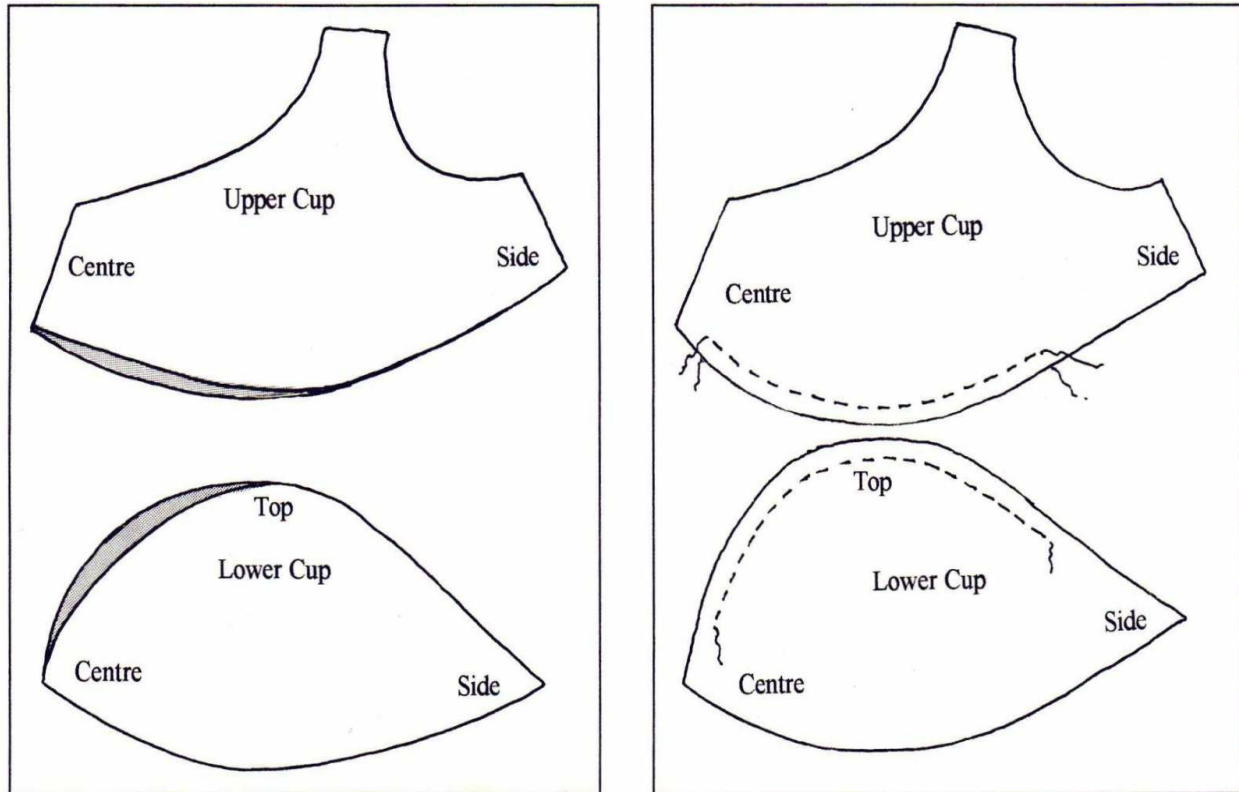
- ***Increasing the cup volume of the inner cup encourages the centre front underwire uprights to sit snugly in against the chest wall.***

Protruding underwire tips can be the bane of many larger busted womens' lives, and anything that helps to overcome this problem is definitely worth investigating!

The following diagram shows how to add inner cup volume to a cup pattern. Note that the maximum height of the lower cup's pattern shape has not changed. Neither has the maximum depth of the upper cup pattern piece been changed. Because neither has been increased, the amount of bust line projection has not been increased (bust line projection, as its name implies, is the degree to which the breasts are allowed to project outwards from the chest wall).

***When adding inner cup volume, the height of the inner section of the lower cup is increased, as is the depth of the inner section of the upper cup.*** The shaded area is the area added to the shape of the cup pieces. To guard

against increased breast separation occurring as a result of increasing the overall length of the central cup seam line, an easing stitch should be used to slightly contract the seam lines of both cup pieces. Diagram below right.



[page 55]

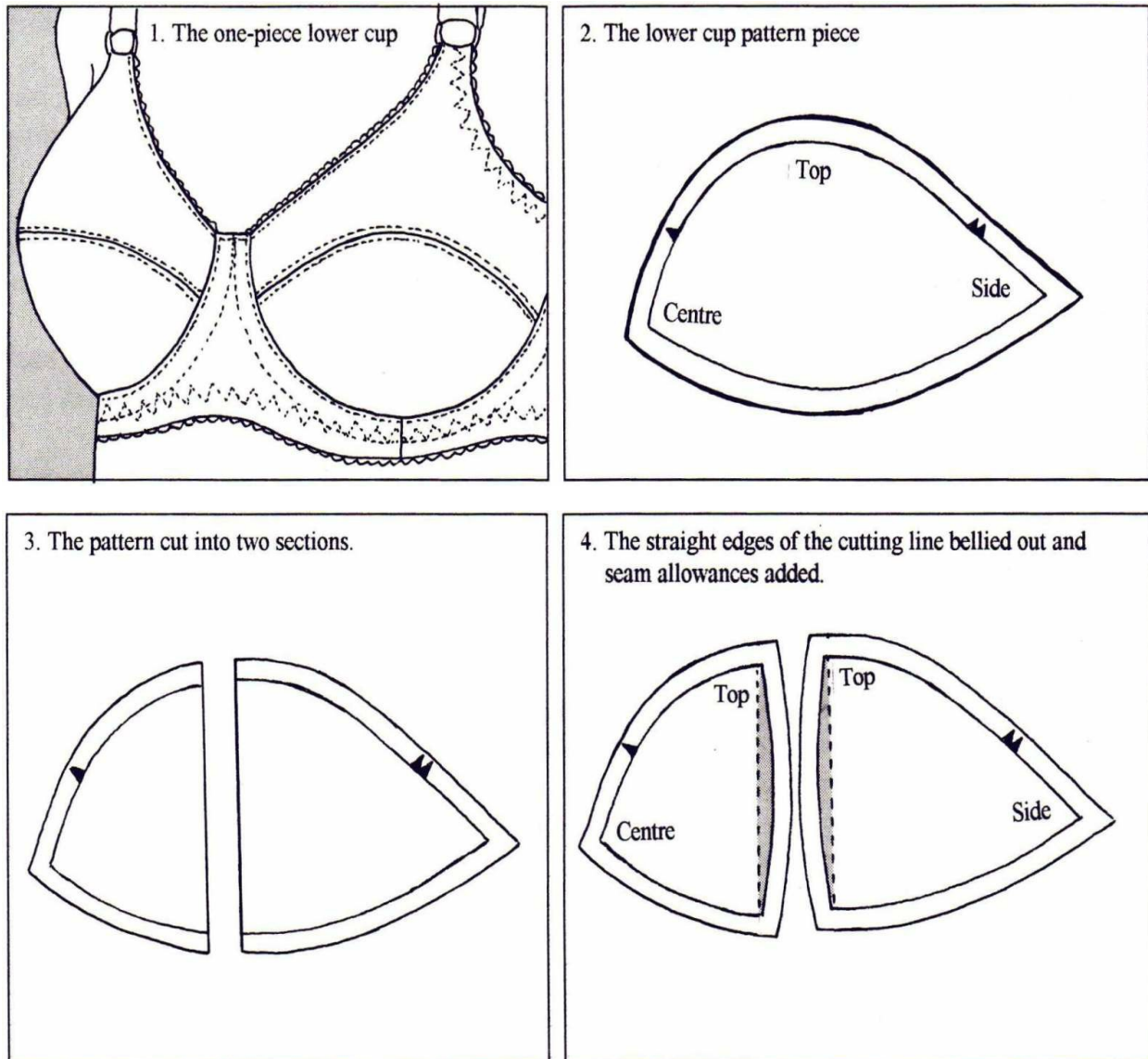
## Slightly Increasing the Volume of the Lower Cup

### 2. SLIGHTLY INCREASING THE VOLUME OF THE LOWER CUP

***Using this method, the single-piece lower cup can be split into two sections, thereby introducing a little extra fullness/cup volume into the lower cup area.*** If the original lower cup was in one whole, elliptical-shaped pattern piece, it can be split into two sections by dropping a vertical line down from its **highest point** (approximately two fifths across the width of the cup when measuring out from the centre front). The two vertical seam lines can be then 'bellied out' slightly, keeping the same top and bottom points. A 1cm seam allowance can then be added to the new mid-lower cup seam lines. This method adds a little extra volume into the lower cup without altering the length of either the cup's mid cup seam line or the



lower cup's wire line seam. It is not a method to be used for adding a substantial amount of cup volume, as if the lower cup becomes too 'full', both breast uplift and a pleasing cup shape will be compromised (the breast will appear to be drooping within the cup). The diagrams below illustrate this process, and the appearance of the cup, with and without a central lower cup seam. The shaded area is the area that is added to both parts of the lower cup pattern once it is divided into two pieces.



[page 56]

## Producing a Substantial Increase in the Lower Cup

### **3. PRODUCING A SUBSTANTIAL INCREASE IN CUP VOLUME**



Altering the height of the armhole and neckline edges, choosing to have a different shaped underwire, decreasing cup space and just slightly increasing the inner cup volume, are all relatively easy to perform. If the best fitting available bra cup is still much too small, and/or its shape needs major modification, this can be more demanding and push us to the limits of our expertise. Even so, it is one of the most rewarding areas of bra making. To design and make a beautifully fitting bra for a very large breasted lady who has never had a bra fit her thus far in her life, (and who often walks out of bra shops in tears), gives wonderful job satisfaction! If you can take up the challenge and succeed, you will have made a friend for life. If you are one of these very large busted ladies, or you have a friend or client who falls into this category, I hope that the following pages will be of help.

***Firstly, make sure that you have tried on every bra available in a large cup size.***

Make your search for the best-fitting bra cup an exhaustive one. Try on every large-cupped bra that you can find, even if the ribcage measurement of the bra is 'miles' too big, and the sales assistant in the shop has to hold the back of the bra in an overlapped position so that you can evaluate the fit of the cup.

It is that cup and its pattern that you are searching for. If you are around about a 14G or 14H, it may well be that the cup volume of a 22F bra fits you very well, and all you need to do is to lower its armhole edge, lower and/or tighten up the neckline edge and perhaps select a shallower and/or narrower shape of underwire.

From what is available, select the bra cup that best supports your breasts (gives quite good uplift and shape) and the one that best allows your breasts to go down and out into the cups so that there is no skin- against-skin under the cups.

When deciding this last aspect, ***notice the position of the centre front tips of the underwires in each bra.*** If they protrude significantly, sitting a fair way out from the front of your chest in between your breasts, this indicates that either:

- the bra's available cup space is totally insufficient. This is an easily recognisable, tell-tale sign, indicating the adequacy of the cup

volume, or

- the neckline edge of the cup is too long and loose. If the cup volume seems to be adequate, but the centre front tips of the underwire are still protruding, 'tighten up' (reduce the length of) the neckline edge of each cup by darting them with pins. A snug neckline edge should help to pull the wire tips back in against the ribcage where they belong.

***When designing bras for the larger breasted figures, I prefer to use a fairly rigid, bonded cup fabric ... either lace or tricot bonded to rigid stabiliser.*** A rigid (relatively non-stretch) cup fabric has the strength to hold large, heavy breasts firmly against the chest wall, (reducing the 'bounce factor') as well as producing a stronger bra that will have a longer garment life.

Heavy breasts cause stretch cup-fabric/lace to fatigue, and become over-stretched within a fairly short space of time, reducing the support and uplift that the cup provides.

***Once you have chosen the best fitting available cup from a manufactured bra, you can draft its pattern, substantially increasing the cup volume using a combination of pattern making techniques:***

- increasing inner cup volume,
- slightly increasing lower cup volume by splitting the lower cup,
- splaying of the cup pieces,
- increasing bust projection, and increasing the stretchability of the cup pieces, particularly that of the upper cup.

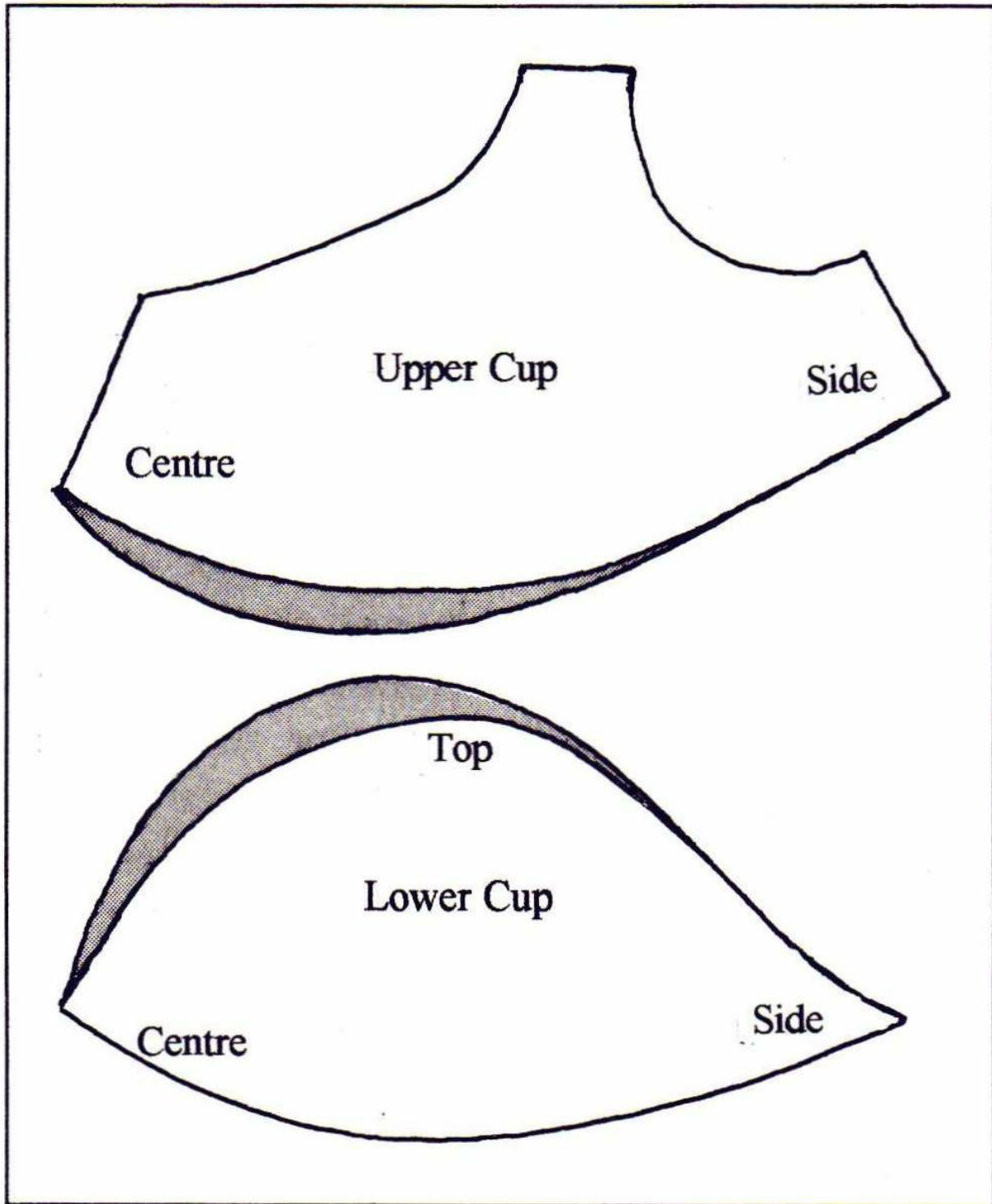
Note: The last option is the only option that leaves the shape and size of the cup pattern pieces unchanged. Altering the shape of the cup pattern pieces will affect the resultant shape of the breast within the cup when the bra is worn, so I suggest that you proceed cautiously when modifying the shape of the cup. When altering the shape and size of the cup pattern pieces in order to produce a substantial increase in cup volume, it is advisable to use two or three methods at a time. If a single method is overused in cup pattern alterations, the cup will end up being distorted in shape.

## Increasing Inner Cup Volume as well as Bust Projection

### **4. INCREASING INNER CUP VOLUME AS WELL AS BUST PROJECTION**

Increasing both the inner cup volume and bust projection can add a substantial amount of cup volume. When increasing the volume of the inner cup, the main swelling of the mid cup seam should be positioned approximately from: the centre front of the bra to the side of each nipple. The side of the cup pieces should taper off so that there is not excessive breast fullness at the side of the cup. The diagrams below show the additional shaded area that is added to the cup pattern pieces. Note that the minimum height of the lower cup's pattern shape has been increased. The maximum depth of the upper cup pattern piece has been similarly increased. Because both have been increased, the amount of bust line projection has been increased.

Bust projection, as its name implies, is the degree to which the breasts are allowed to project outwards, away from the chest wall. The greater the depth/height of the area that is added to the pattern pieces, the more the breasts will project forward, away from the chest wall (away from the body's natural centre of gravity). Care has to be taken to ensure that bust projection isn't excessive. Note: Where the breasts are very large and heavy, excessive bust projection will not only make button-through clothes gape at the centre front, but can also place excessive pressure on the tops of the shoulders and cause shoulder and back problems (these physical problems arise because the bulk of the weight of the breasts has been shifted too far forward, away from the body's natural centre of gravity). In this case, it is better to reduce the amount of bust projection (on the pattern), keep the lower cup fabric firm/rigid (this will maintain the uplift the cups provide) and use a different upper cup fabric: one that contains an increased amount of horizontally-placed give or stretch. Altering the upper cup fabric like this will enable the upper cup area to provide more cup volume whilst moving some of the breast bulk back in against the chest wall. Refer to [page 59](#).



When changing the shape of the cup pieces in this way, ***you will be adding to the length of the middle cup seam line on both the upper and lower cup pieces.*** Once the new cup pattern pieces have been initially drawn, check the relative lengths of their mid cup seam lines. Refer to [page 35](#). If one

seam line is slightly longer than the other (up to 1½ cm difference on a DD sized cup), a line of easing stitch can be used to equalise their lengths. If the difference in their lengths is greater than 1½ cm then the shaping of one or both pattern pieces has to be reconsidered and re-drawn. Either swell out the curve of the shorter seam line or decrease the swelling of the longer seam line, or slightly adjust both in this way and then re-measure. Even if the seam lines are exactly the same length, I will often use a line of easing stitches on the central cup seam line of both upper and lower cup, especially if the cup fabric is fairly rigid/non-stretch. Easing stitches positioned over the point/tip of the cup, and pulled taut to an equal amount before the cup parts are sewn together, ensure that the tip of the cup is not pointy in appearance when viewed in profile. Note: Easing stitches are extremely long straight stitches sewn right on the longer seam line over the point of the cup: from the side of the nipple area down into the centre front. They can be used to 'grab' the longer seam line in, so that it is the same length as the slightly shorter one. To 'grab' the seam line in, pull the bobbin thread taut or tight so that the cup piece can no longer lie flat, and looks slightly cupped when it is placed on a flat surface. In this way a seam line length discrepancy of up to 2 cm. can be overcome.

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## Increasing the Cup Volume by Splaying the Cup

### **5. INCREASNG THE CUP VOLUME BY SPLAYING THE CUP HORIZONTALLY**

This is the traditional method of 'cut and spread' applied to a bra cup pattern.

When this method is used alone to provide a significant increase in cup volume, it is only moderately successful, because the mid cup seam line of the cup becomes too long and the upper and lower cup pattern pieces become too wide in shape, resulting in an excessive amount of breast separation.

***Combining this technique with method 1 ([page 54](#)) ensures greater success, as the cup pieces are expanded in a more balanced way: both vertically and horizontally.*** Because the two methods will be used in conjunction with one another, they can each be applied in a moderate (rather than extreme)

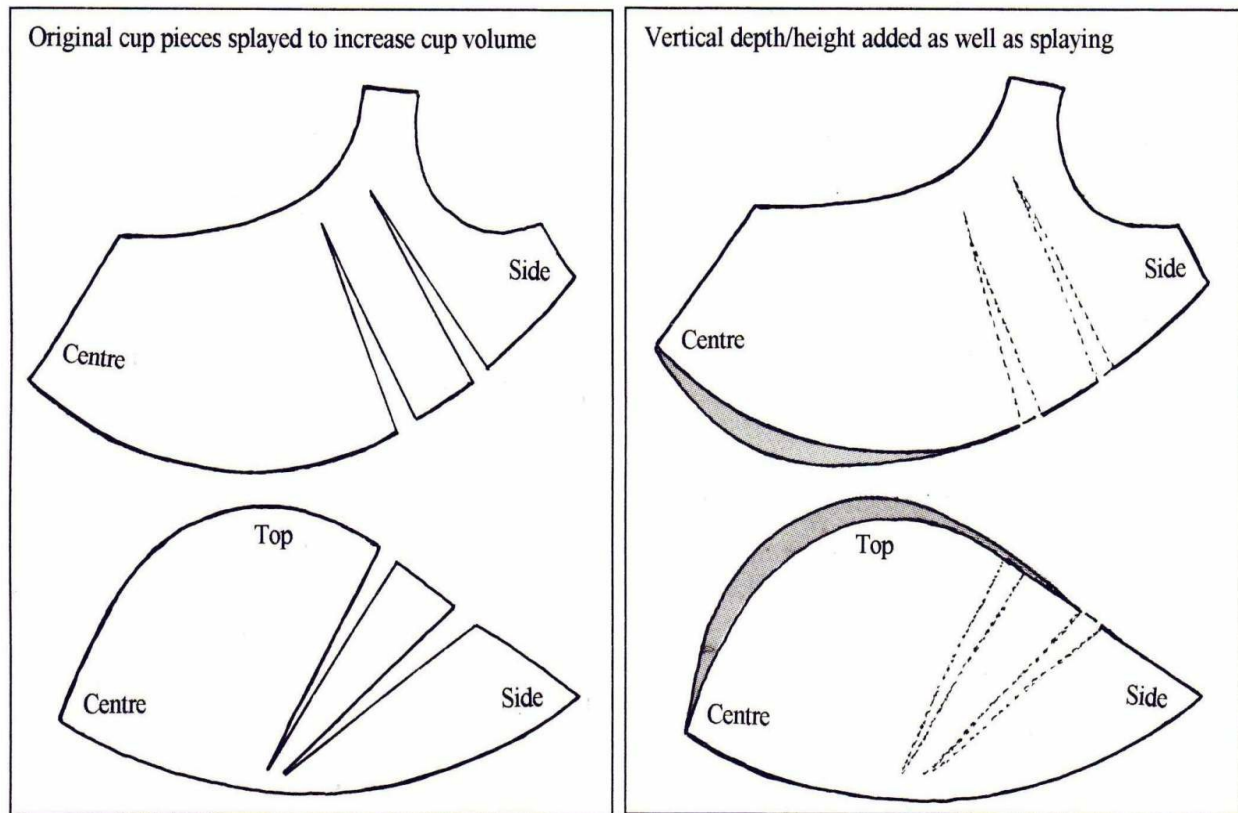
way to produce a significant increase in cup volume. I have found that a cautious approach is often more successful than performing 'radical surgery' on a cup pattern, especially if you wish to retain the original successful cup shape. If a significant increase in cup volume is desired, the following methods may be used together: increasing inner cup volume, increasing bust projection, splaying of the cup pieces and increasing lower cup volume by splitting the lower cup.

When cutting and spreading, the position of the cuts is very important, as it can affect the shape of the breast within the cup.

If the cup pattern is predominantly cut and spread in the area between the nipple and the centre front, (in the inner-cup area) an excessive, unwanted increase in breast separation can occur.

***Cutting and spreading is therefore safest when the cuts are distributed evenly across the cup, or when the cuts are positioned mainly in the outer cup area*** (between the nipple area and the side of the cup). ***The inner cup area is predominantly where the height of the lower cup/depth of the upper cup, can be increased.*** Because each seam line has been lengthened in this process, the lengths of the seam lines should be measured/checked against one another, once the pattern pieces have been initially re-drawn. Fine-tune the shapes of the pattern pieces until you are pleased with their shapes and their mid cup seams are approximately the same in length. To help guard against excess separation occurring, (a danger whenever the mid cup seam is lengthened) a line of easing stitches can be used along the inner cup central seam line on both the upper and lower cup pieces, which will slightly contract the length of the seam line. Easing has the added advantage of creating even extra cup volume in the inner cup, if the breasts are extremely full near the cleavage.





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## Altering Cup Fabric to Increase Cup Volume

### 6. ALTERING THE CUP FABRIC/LACE TO INCREASE THE CUP VOLUME

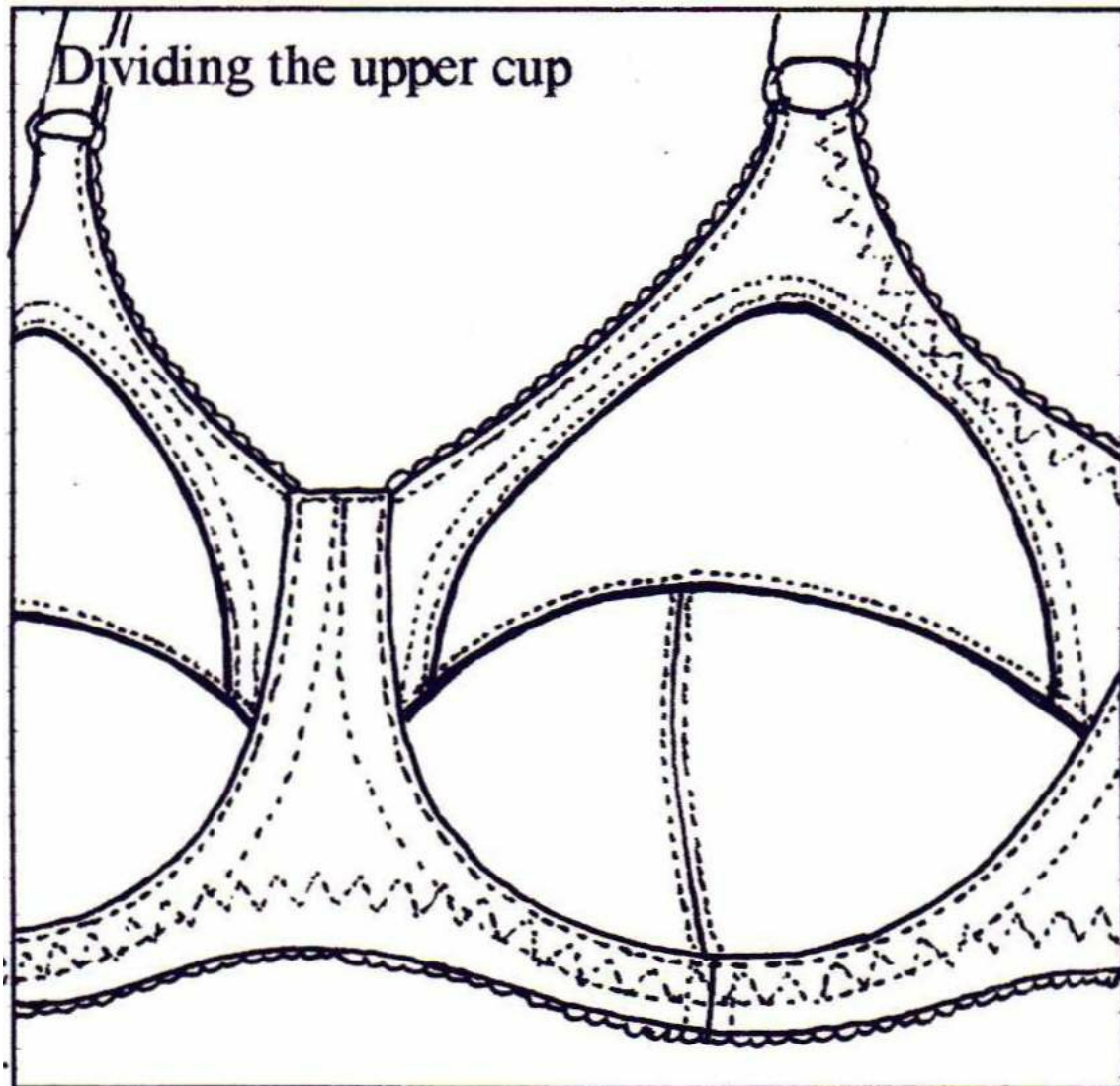
When using this method, the shape and size of the cup pattern pieces can remain unchanged.

If the cup fabric/lace contains very little stretch or give, **increasing the stretchability of the cup fabric, whilst using the same cup pattern will provide extra cup volume.** The amount of added cup volume depends upon both the proportion of the cup that is changed in this way, and the degree of increase in the amount of stretch or give contained within the new cup fabric. I would initially favour increasing the stretchability of the upper cup alone, as retaining a more rigid fabric in the lower cup will maintain the uplift that the cup gives. (The more stretch or give that is contained in the lower cup fabric, the greater the opportunity for the bulk of the breast to 'droop' in the cup).

As always, it is best to make small, cautious changes, one at a time, slightly increasing the stretchability of the cup fabric, one cup piece at a time, until

you have the cup volume just right. Your options are:

- ***to increase the total upper cup's stretchability.*** I recommend having the main give/stretch running across the upper cup, parallel to the neckline edge, so that the stronger non-give direction in the fabric is running vertically on the upper cup, supporting the full weight of the breasts and preventing the side of the cup from bulging. You may need to reinforce the neckline edge so that it remains firm.
- ***to increase the stretchability of both the upper and the lower cup.*** (To maintain breast uplift, I suggest that the greatest stretch or give in the lower cup is placed in a vertical direction on the cup. The reason for this, is to prevent the breast from stretching the lower cup outwards/horizontally, therefore forcing the volume of the breast upward in the cup, creating uplift).
- ***to create an inner area of the upper cup that will have increased stretchability.*** The diagrams below illustrate the creation of an inner upper cup area that will be sewn out of a fabric or lace containing greater stretchability. Keep in mind that if a stretch lace is used in this area, sheer tricot lining (which contains excellent give) can be used to line and strengthen the stretch lace. The direction of greatest stretch or give in this new triangular, upper cup section should be placed approximately running across the cup, parallel with the neckline edge. The new, neckline and armhole edge cup piece will be made out of a fairly firm low-stretch fabric: a good quality powernet or spandex (again, any give in this piece is to run approximately parallel to the neckline edge). If extra strength is desired, this fabric can be doubled.



If increasing the stretchability of the cup parts, I suggest that fabrics containing more **give** (rather than stretch) be used, as they are stronger. If you are going to vary the stretchability of the cup pieces, it is advisable to have a working knowledge of the range of fabrics available in bra making, which is another reason why this method requires some bra making experience. Often the cups in larger-cupped bras are made of a bonded fabric: a lace or a tricot bonded or fused to a strong, fine nylon knit, similar to that used in the pockets of men's trousers. This strong, non-stretch nylon knit is called **Rigid Stabiliser**. This fabric has only a very slight one-way give, and it is the structural strength of the whole cup. The lace or knitted fabric on the outside of the cup, over the stabiliser, is purely cosmetic. If the whole cup in your pattern bra contains rigid stabiliser, and you want to increase

the cup volume, you may wish to make the upper cup out of one of the tricot or a lined, stretch lace. Single-knit Tricot is the thin, filmy fabric often used to make half-slips (petticoats). Of the two tricot, Single-knit Tricot has the best one-way give. Double-knit Tricot has a little less one-way give, but it has the advantage of being thicker and thus stronger, which is an advantage if the breasts are very large and heavy. Using the same principle, even greater upper- cup volume can be created by substituting a stretch lace into the upper cup. Greater strength can be built into the upper cup by lining the stretch lace with Sheer Tricot Lining. Sheer Tricot Lining is a fine nylon knit that appears to be similar in appearance to rigid stabiliser but has excellent one-way give (the greatest give in the tricot lining usually runs in the same direction as the greatest stretch in the lace). Lining stretch lace with sheer tricot lining while strengthening the lace, will also maintain its delicate, transparent appearance.

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## SOLUTIONS TO COMMON BRA PROBLEMS

### *A Loose Underarm Edge*

#### **1. What can I do if the top underarm edge is very loose?**

If the top underarm edge of the bra back is very slack, there will be a couple of tell-tale signs:

- vertical puckers across the point of the cup in the nipple area, and
- the underarm tip of the underwire will not be sufficiently splayed on the body, causing the underwire tip to be positioned too far forward where it will catch on the inside of the upper arm.

When the bra is worn, both of these symptoms will largely disappear if a dart is pinched into the bra back in the underarm area. To reduce this slackness in a bra, I would firstly recommend tightening the top underarm edge of the **bra back**, (so that there is less fabric along the top of the bra between the side tip of the underwire and the closure) and then if a further tightening is required, I would recommend slightly reducing the length of the cup's armhole edge. Refer to [pages 45-47](#).

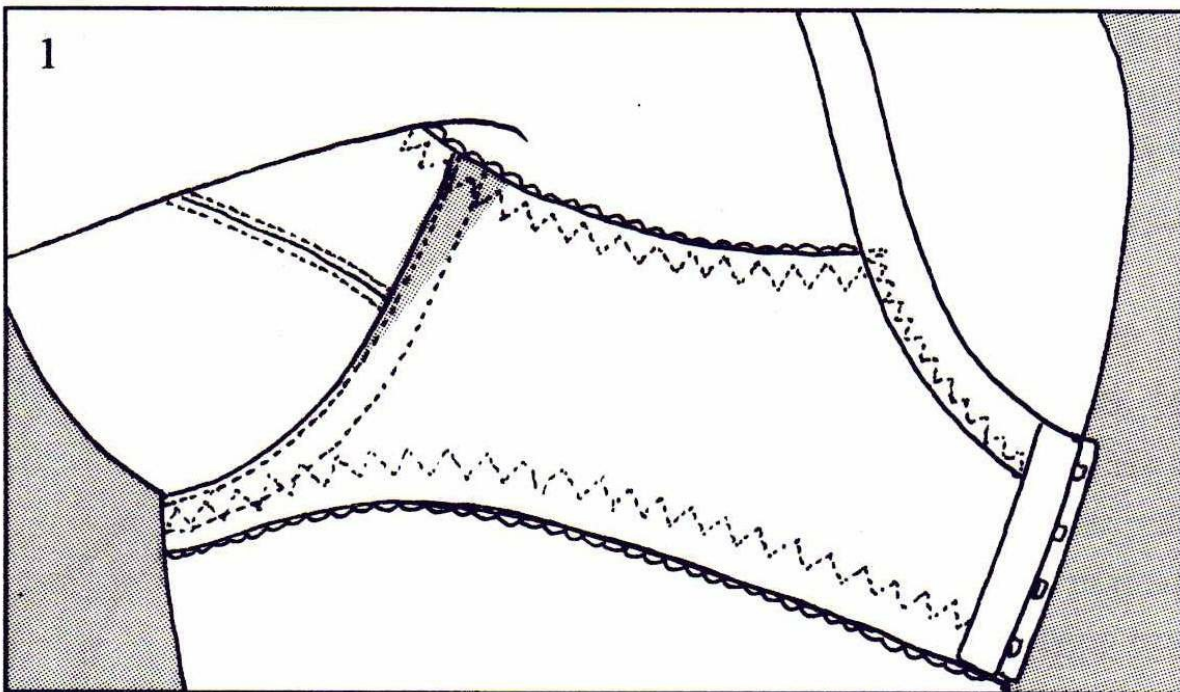
- Tightening the top underarm edge of the bra back is simply a matter

of subtracting a wedge out of the bra back pattern piece along the side upright of the underwire, (diagram 1 below).

In a Y centrepiece style, shave off a wedge of fabric as shown by the shaded area in diagram 2a. If doing this makes the wire line seam of the bra back too long, reduce the pattern under the cup space (as shown by the shaded area in diagram 2b).

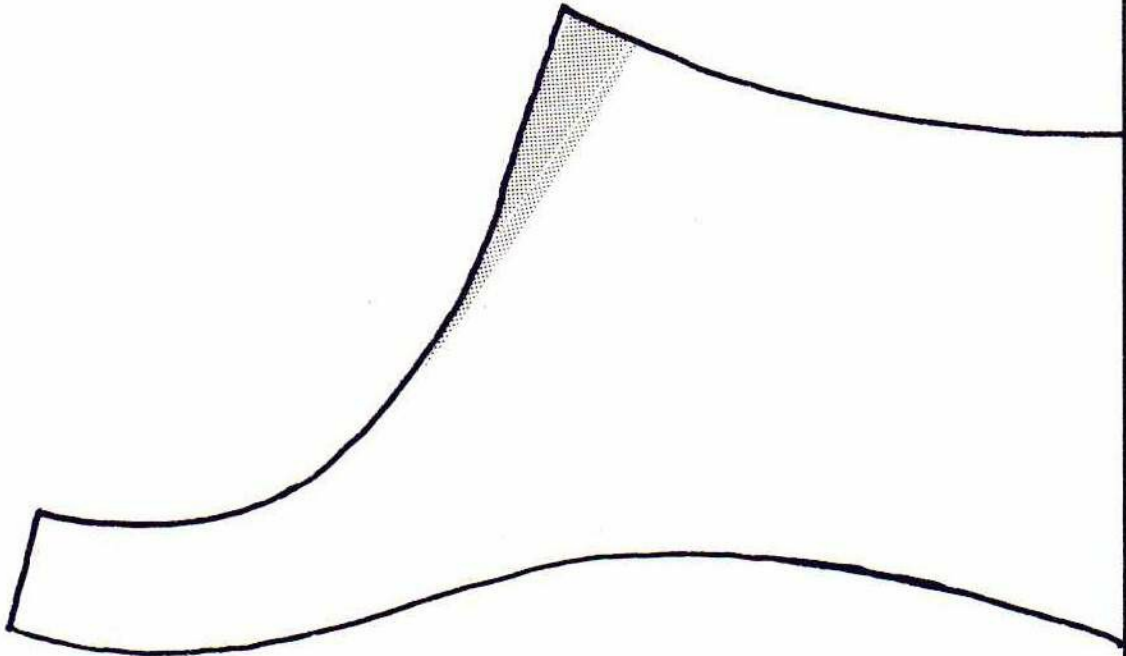
In a small centrepiece style, a similar wedge can be taken out of the bra back, (shaded area in diagram 3a). If doing this excessively increases the length of the bra back's wire line seam, the lower edge of the bra back where it meets the cups can be raised accordingly (the shaded area in diagram 3b).

In an extended centrepiece style, a wedge can be shaved off the bra back and/or the extended centrepiece (the shaded areas in diagram 4). Remember that in this style, where the centrepiece joins to the bra back there is a common seam line that has to be the same length on both pattern pieces.

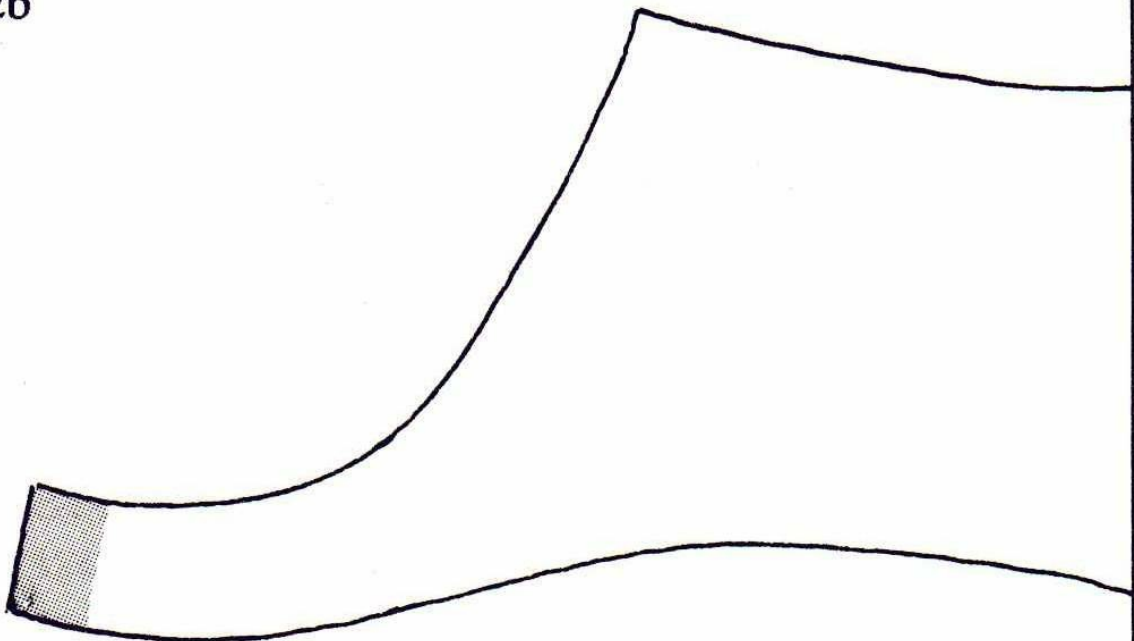




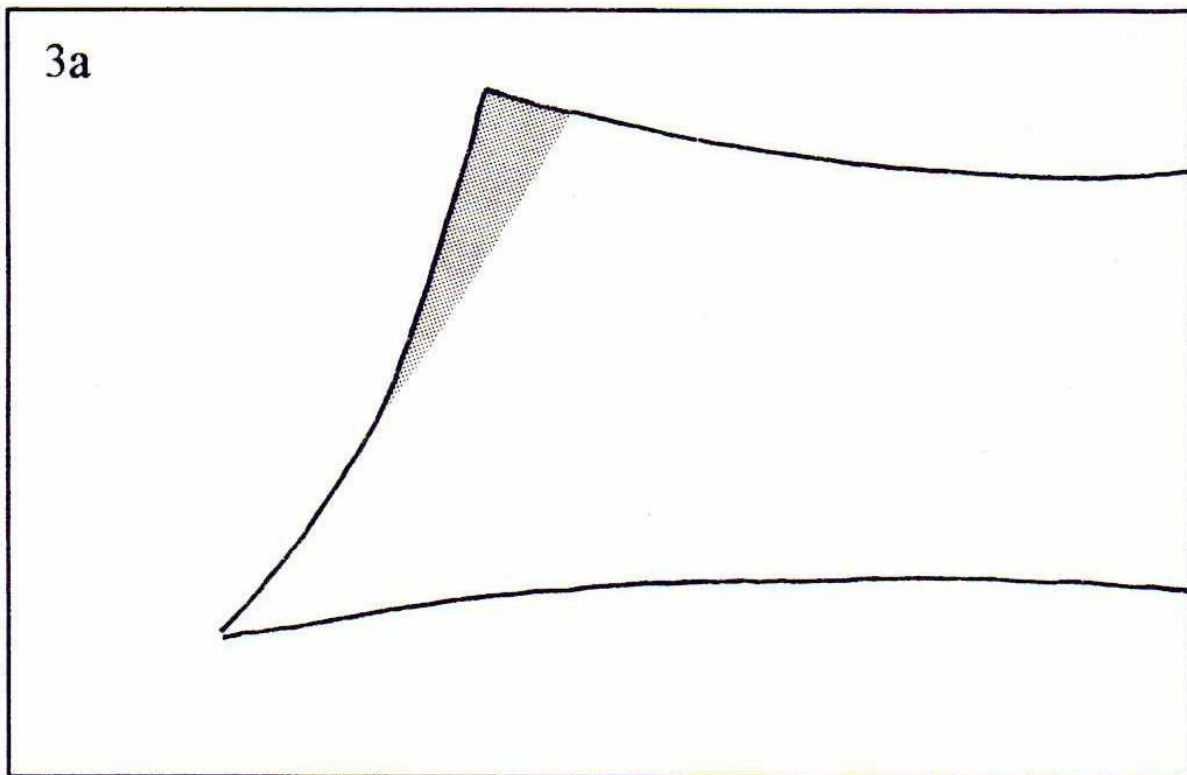
2a



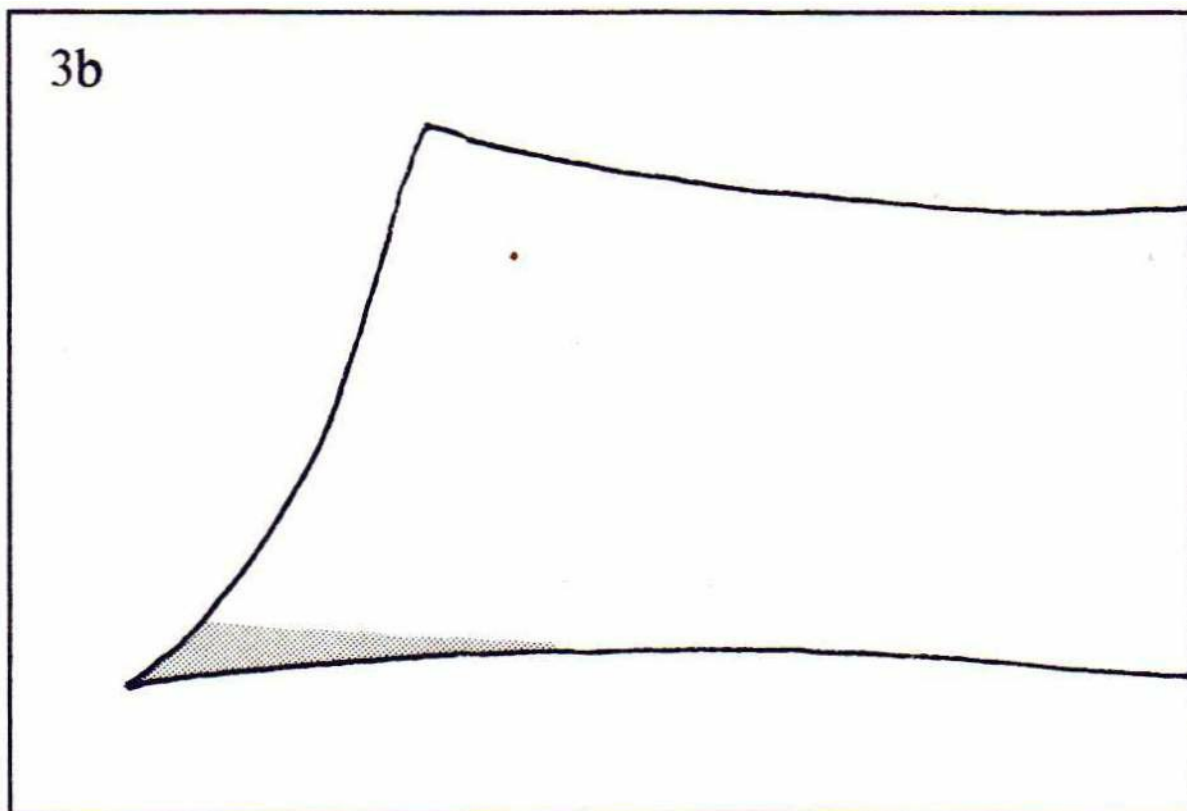
2b

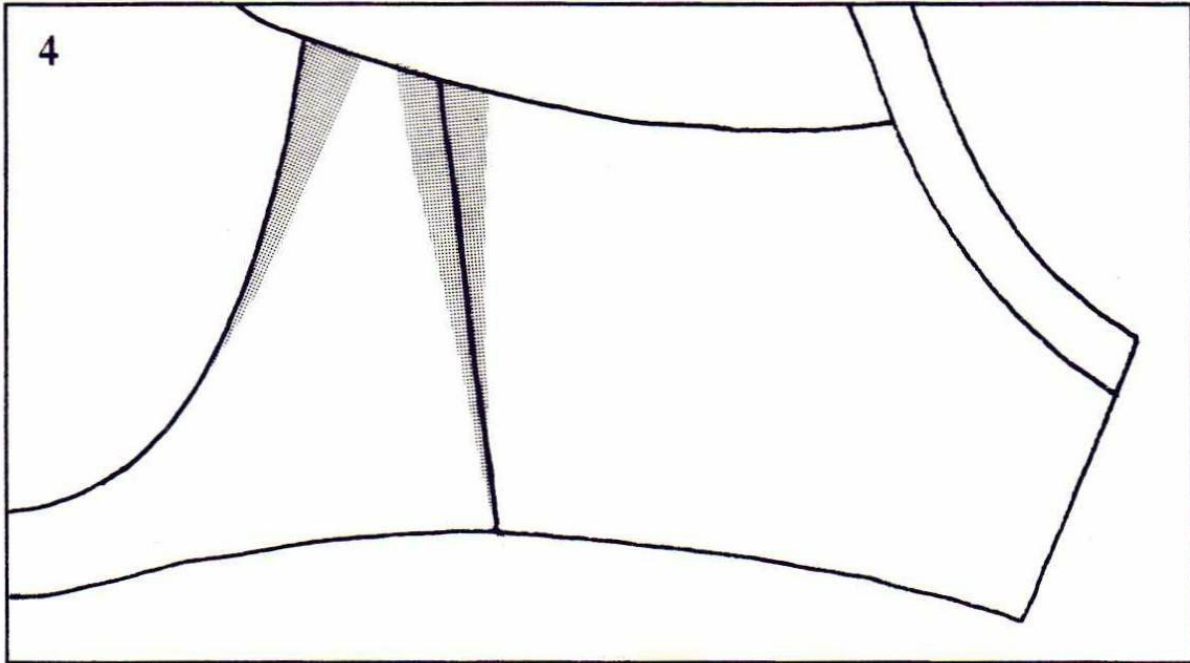






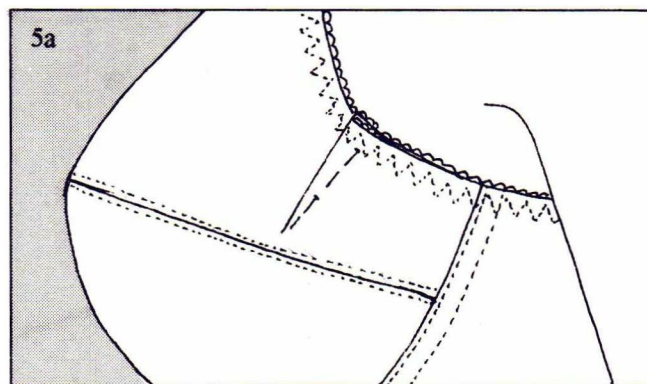
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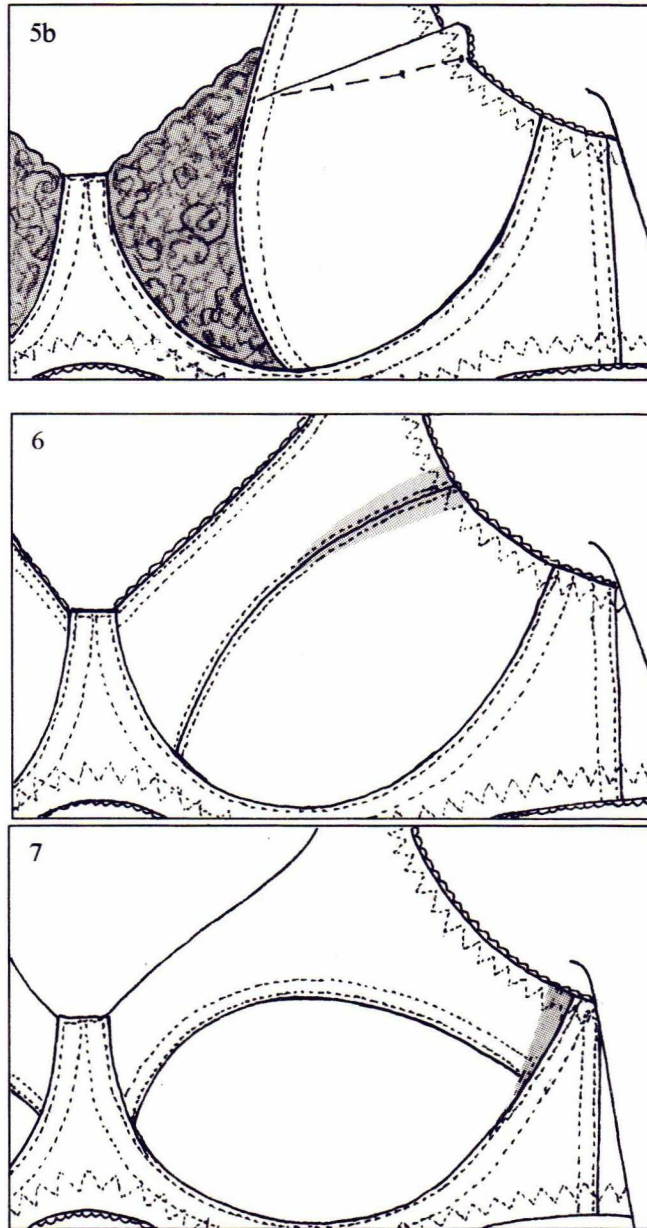




Additional tightening of the underarm edge of the bra can be achieved by

- darting the cup pattern's armhole edge (if your cup has a horizontal or vertical seam line: diagrams 5a and 5b below), and/or
- increasing the seam allowance as the mid cup seam line approaches the armhole edge (if your cup has a diagonal seam line: diagram 6 below), and/or
- subtracting a wedge out of the side of the cup along the wire line seam: diagram 7 below.





## An Underwire that sits Down on the Front of the Chest

### ***2. What can I do if the underwire is sitting down on the front of the chest instead of up in the body's natural wire line crease?***

This annoying problem can be caused by a number of factors: either the wires are too deep a U shape, (a wider, shallower U shape similar to the hull of a flat-bottomed boat may be better), and/or the cup volume may be insufficient, and/or the cup shape may be too shallow and/or the breast may be drooping within the cup due to a very loose, slack lower cup. If the shape of the wire is not too deep, then I suggest:

- tightening the lower cup to increase uplift, increasing the upper cup volume accordingly, and
- ensuring that there is sufficient cup volume and a full enough cup shape so that all the breast can go down and out into the cup.

If there is adequate breast uplift, the wire shape is correct, the cup volume adequate, and the cup shape is full enough, the underwires will sit snugly up in the body's wire line crease all around the breast.

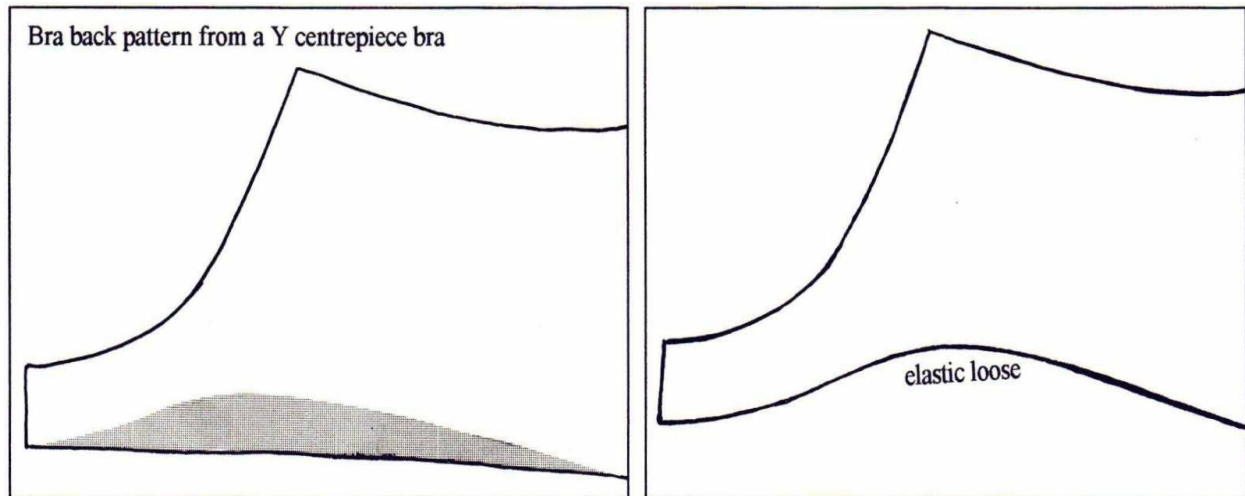
[page 62]

## The Rolling Lower Edge under the Arm

### ***3. What can I do if the bottom edge of my bra in the underarm area always rolls/concertinas?***

This common problem is caused by the way the layer of fat is distributed on our ribcages, and unfortunately, the more overweight we are, the more irritating this problem can be. To overcome this problem, bra manufacturers often insert a vertically placed strip of polyester boning in the underarm region, however if you are short waisted, this boning can 'dig in' unmercifully. Some suggestions:

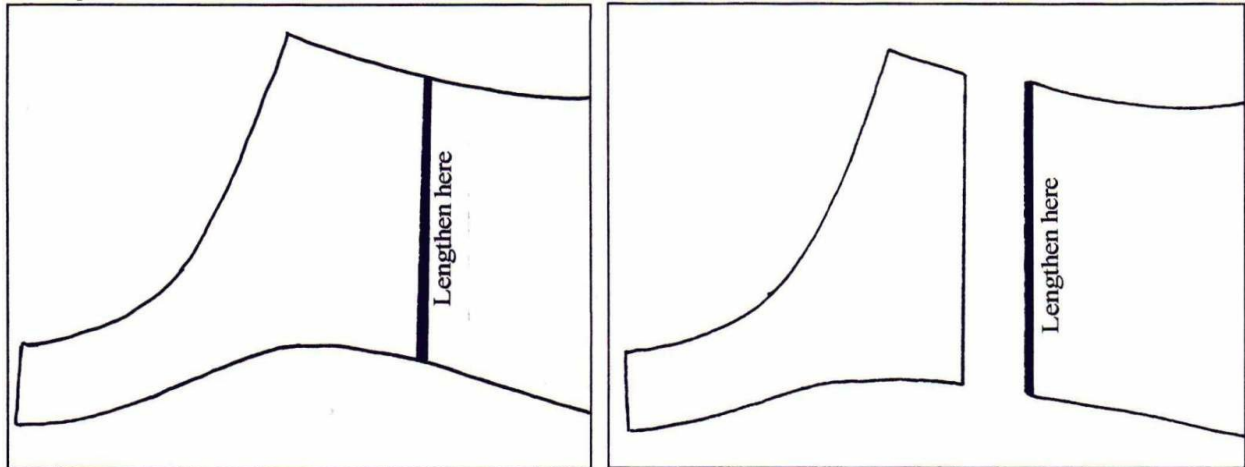
- make the underarm lower edge of the bra back an arch in shape, rather than a straight line that goes straight across the torso. Doing this will make the pattern work with the body shape rather than against it. Diagram below left. The shaded area is the area to be deleted.
- Construct the bra back out of heavier, stronger fabric so that this part of the bra contains more garment 'body' and is therefore less inclined to fold over onto itself.
- Use wider scalloped elastic around the lower edge of the bra and when sewing it onto the bra back fabric, 'loosen' it when sewing it onto the arched section (don't pull it tight in this area).
- Stitch a piece of felt-type underwire casing vertically onto the bra in the underarm region ... this will give the problematic area even more garment body.



#### ***4 What can I do if my bra is too tight around the ribcage?***

- Always add length to the bra back in the underarm region of the pattern.

Never add length to the bra back at the centre back (at the hooks and eyes), as doing this effectually moves the back strap attachment points further out towards the arms, causing the straps to fall over the shoulders. On every commercial bra pattern there should be a thick, black vertical line drawn on the underarm region of the bra back pattern piece saying: 'lengthen here if necessary.' When adding extra length to the bra back, cut the bra back in two, and then separate the two halves of the pattern an appropriate distance, depending on how much too tight the bra is. Pin a new piece of pattern making fabric over the two pieces and re-trace the lengthened pattern piece. If your bra is an extended centrepiece style, add the additional length to the stretch-fabric bra back piece at the side seam.



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## Straps That Fall Over the Shoulders

### ***5 What can I do if my bra straps continually fall off my shoulders?***

The body shape that is particularly prone to this problem is the one where the shoulders are very sloped, i.e. the angle from the base of the neck, down to the shoulders is quite steep. This situation is the result of your particular body shape combining disastrously with poorly designed and poorly made bras.

The aspects of manufactured bras that cause the straps to fall off shoulders like this are listed below.

It may well be that a number of these aspects are contributing to your problem.

- \* Strap attachment points both at the front, and especially at the back of the bra, being positioned far too close to the armhole area,
- \* Non-stretch shoulder straps, or inferior quality shoulder strap elastic containing poor elasticity/'memory',
- \* Lace straps that extend from the top of the cup up to the top of the shoulders (which reduces the overall stretchability of the strap),
- \* Strap elastic that is too narrow.

The solution to this problem is to:

- ***Design the bra back so that shoulder straps are sewn to the bra***



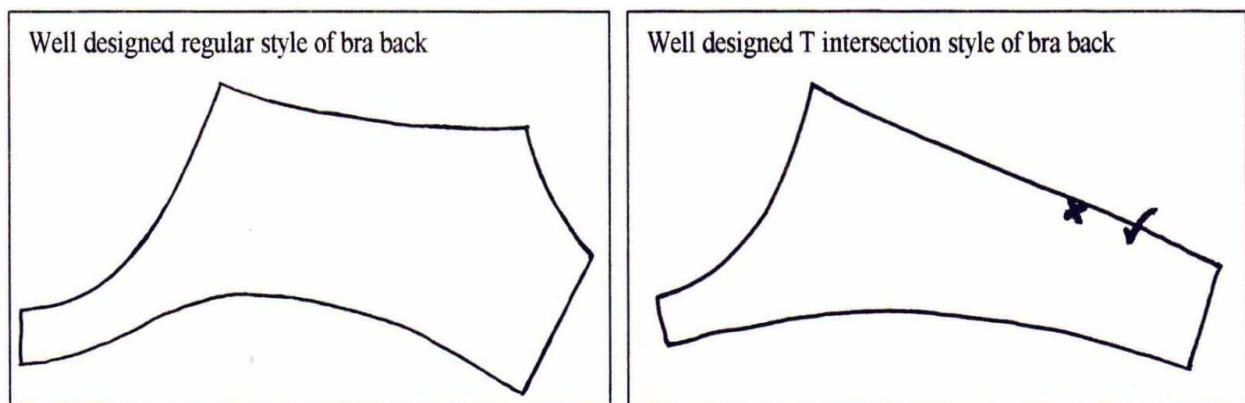
**back, at a point very close to the hooks and eyes** (move the back strap attachment points right over towards the centre back line of the body). If your bra straps continually fall off your shoulders, the back strap attachment point should be no further away from the closure edge than 1/4 of the distance between the closure edge and the side of the cup.

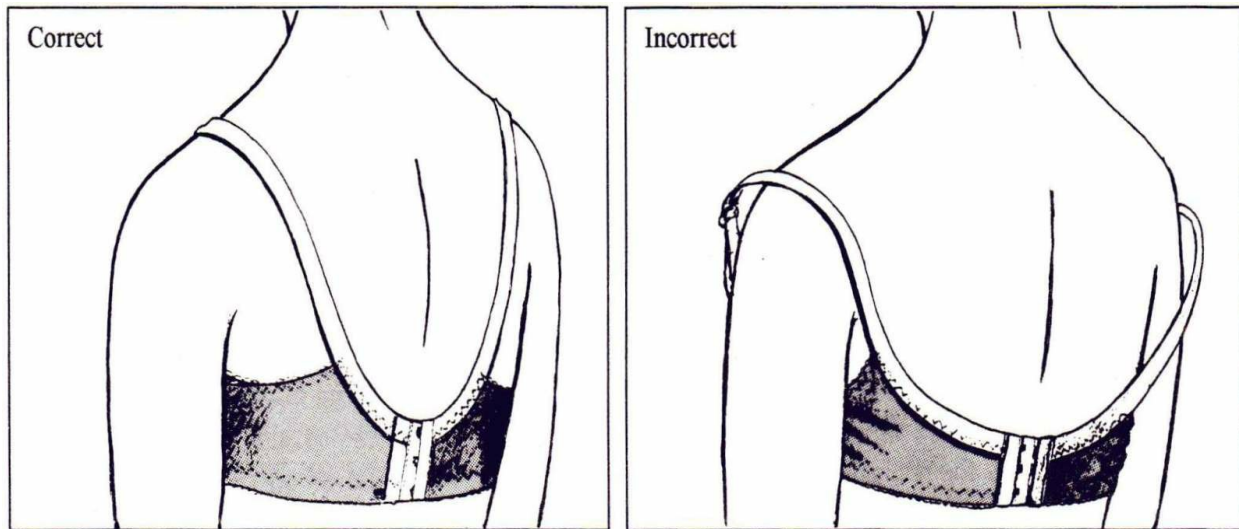
- **Design the upper cup so that the straps attach to it a little closer to the centre front.** The optimum placement of the front strap attachment point is directly above: the side of the areola to the centre of the nipple (diagram next page). The diagrams below illustrate back strap attachment points.

- **Use good quality shoulder strap elastic ... strap elastic that contains excellent 'bounce'.**

Not only will better quality strap elastic not allow the straps to fall off the shoulders, it is much more comfortable to wear, as it can be done up very firmly without it cutting in at the top of the shoulders.

- **When sewing your bras, choose a strap elastic that is a little wider than you would normally have.**
- **Reduce the non-stretch proportion of your entire strap.** If your cup design incorporates a non-stretch lace strap that extends part or all of the way up to the top of the shoulders, reduce the length of the lace strap so that it joins onto the elastic strapping much further down, nearer to the top of the cup. This will increase the overall stretchability of the strap, thus helping to prevent this problem.





[page 64]

## A Loose Ribcage Fit

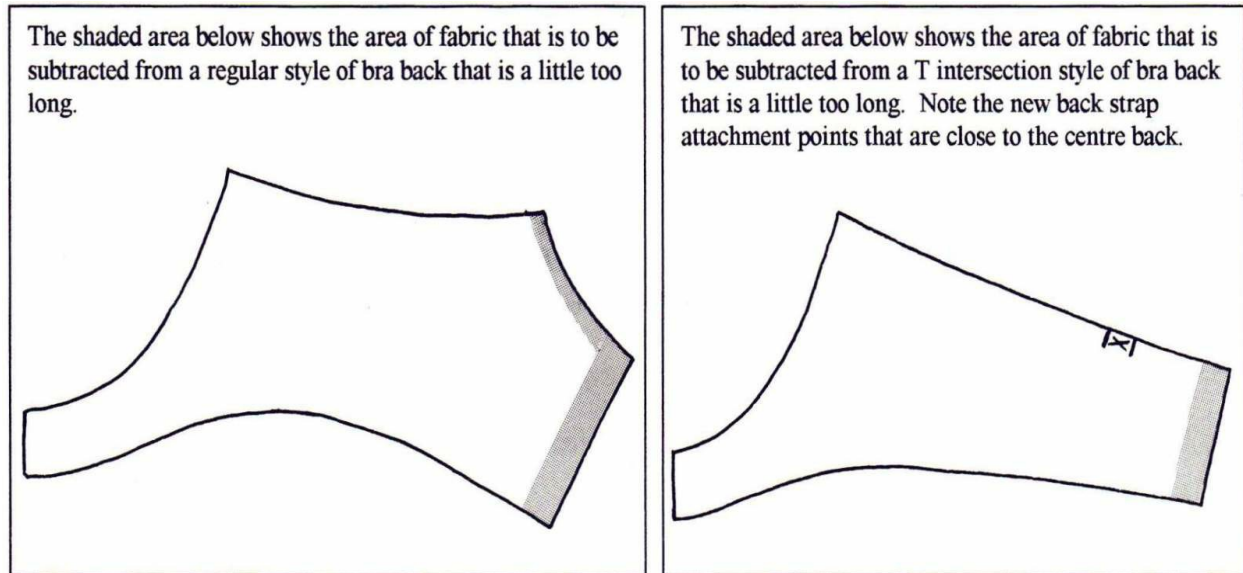
### **6 What can I do if my bra is too loose around the ribcage?**

When reducing the length of a bra back, the rule is to subtract area from the centre back, thus keeping the back strap attachment points close to the centre back line of the body so that the straps don't fall over the shoulders. If your bra back is a regular style (it has the strap sewn to the edge that leads down to the hook/eye tabs) and it is necessary to reduce the length of the bra back, it is important to maintain both: ***the angle of the edge that leads down to the closure, as well as the correct height of the closure edge*** (the correct height of the closure edge will be determined by the number, and spacing of the hooks/eyes in the closure tabs).

To visualise the way in which one of these regular style bra backs is shortened, refer to the diagram below left. When re-drawing the centre back region of the bra back pattern, follow the diagram on the bottom of [page 27](#).

Alternatively, ***if your bra back is in a T intersection style, then the bra back can be safely shortened in the underarm region, as long as the points at which the straps are sewn to the bra back are moved closer to the centre back line***. As no complicated re-drawing of the pattern needs to be done, this pattern alteration is very easily accomplished. Where the pattern piece is shortened in the underarm region, you may have to smooth out any

irregularity in the upper and lower edges, but this is not difficult. To visualise the way in which one of these T intersection bra backs is shortened, refer to the diagram below right.



[page 65]

## Increasing Uplift

### **7 What can I do to increase the uplift my bra cups give?**

Breasts are very soft and will to a large degree adopt the shape of whatever bra cup is put onto them. Breast uplift is mostly produced by the shape, and type of that bra cup. If the lower cup area in a bra cup is made out of high stretch fabric (e.g. nylon lycra), that has its greatest stretch going in a horizontal direction on the cup, the weight of the breast in the cup will cause the lower cup to greatly expand (width-ways) giving the overall bustline an aged, drooping appearance. No matter how tightly the bra straps in such a bra are done up, this will produce little or no uplift provided by the bra. This may be an extreme example, but it serves to illustrate the fact that the shape of the bra cup, and the stretch-ability of its fabric, greatly affects the amount of uplift that a bra provides. In an ideal bra, the cups themselves should support the breasts, only relying on the shoulder straps to supplement the support and uplift that the cups themselves provide. **A reasonably taut, firmly-fitting lower cup** is critical to good bra support. If you suspect that the lower cup of your bra is not as firm-fitting as it should

be, I suggest that you tighten it up/pin a vertical dart into it, and then look at your profile in a mirror to observe the amount of uplift achieved. If doing this makes a substantial improvement, then the same alteration needs to be done to the lower cup's pattern. Another very important factor in enhancing uplift, is ***good quality elastic shoulder straps that attach to the top of the cup in the optimum area.***

This optimum front strap attachment area (the point that will produce maximum strap uplift) is indicated by the shaded area in the diagram below left. For maximum strap uplift:

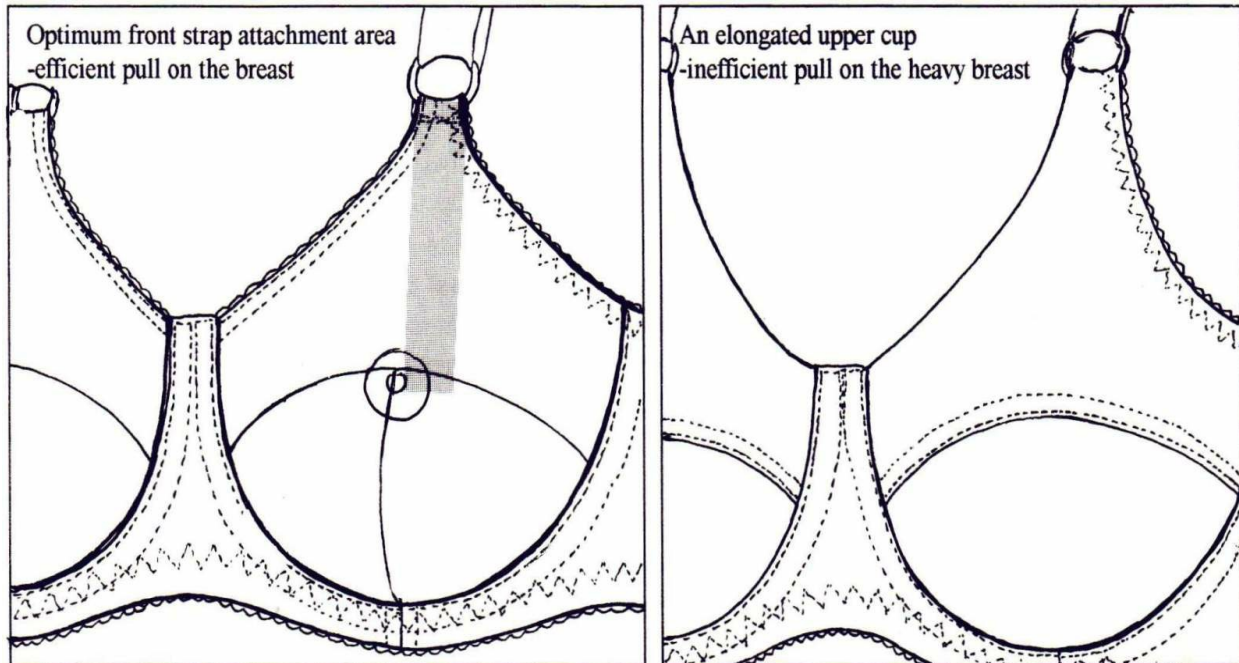
- ***the strap should join to the cup approximately at the top of the breast tissue*** (where the breast tissue finishes at the top of the cup), and
- ***the strap should join to the cup directly above the side of the areola.***

Designing a successful bra is very much an engineering exercise. Because I am not an engineer, I cannot prove the accuracy of the following personal opinions, they are simply based on observations that I have made.

- ***If the front strap attachment point (the ring at the top of the cup) is positioned too high, the uplift that a strap can provide will be compromised.*** If the top part of the upper cup is very drawn out/elongated, and the straps are attached to it quite high up, near the collar bone or top of the shoulder, the ability of the strap to lift the weight of the breast is diminished because of the distance between the bulk of the breast and the strap. When the strap is adjusted so that it is firm, it firstly has to pull on all the fabric between it and the cup before having an opportunity to pull up on the cup itself. In this type of design, the knit fabric of the elongated fabric strap section absorbs the strap pressure before the strap tension has a chance to act on the cup itself. In this way there is a consequent reduction of the strap pressure acting on the cup (its ability to lift the breast).
- ***The more rigid/non-stretch the cup fabric is, the more effective is the action of the strap when it is tightened to lift the breast/cup.***

This is one of the reasons why I prefer to make large cupped bras out of rigid cup fabric (a bonded lace or bonded tricot that incorporates rigid stabiliser). Rigid cup fabric combined with a well-designed cup shape, will produce a cup that in itself, will support the breast to a large degree, only relying on the strap to provide supplementary uplift. Such a cup allows the strap elastic to do its work of lifting the weight of the breast with maximum efficiency.

- ***If the straps are attached to the upper cup very close to the arms, the straps will tend to pull on the side of the cup, and not lift the bulk of the breast that is in the centre of the cup.*** Having front strap attachment points that are very close to the arms is a design feature that is utilised by many of the push up bras. Straps that pull on the side of the cup create a tight, flat cup side and force the bulk of the breasts inwards towards the centre front (thus enhancing the cleavage). Whilst being a wonderful feature of a push-up bra, this design feature is not appropriate for bras of a larger cup size where support and uplift must be maximised. If the larger-sized cup is either padded or contains very rigid fabric to the extent that the straps, and the uplift needed from them is only of minimal importance, then the straps may safely be attached to the upper cup very close to the arms, but this is the exception rather than the rule. In normal circumstances, when designing bras that offer heavy breasts good uplift and support, the straps should be attached to the upper cup directly above the side of the nipple.



[page 66]

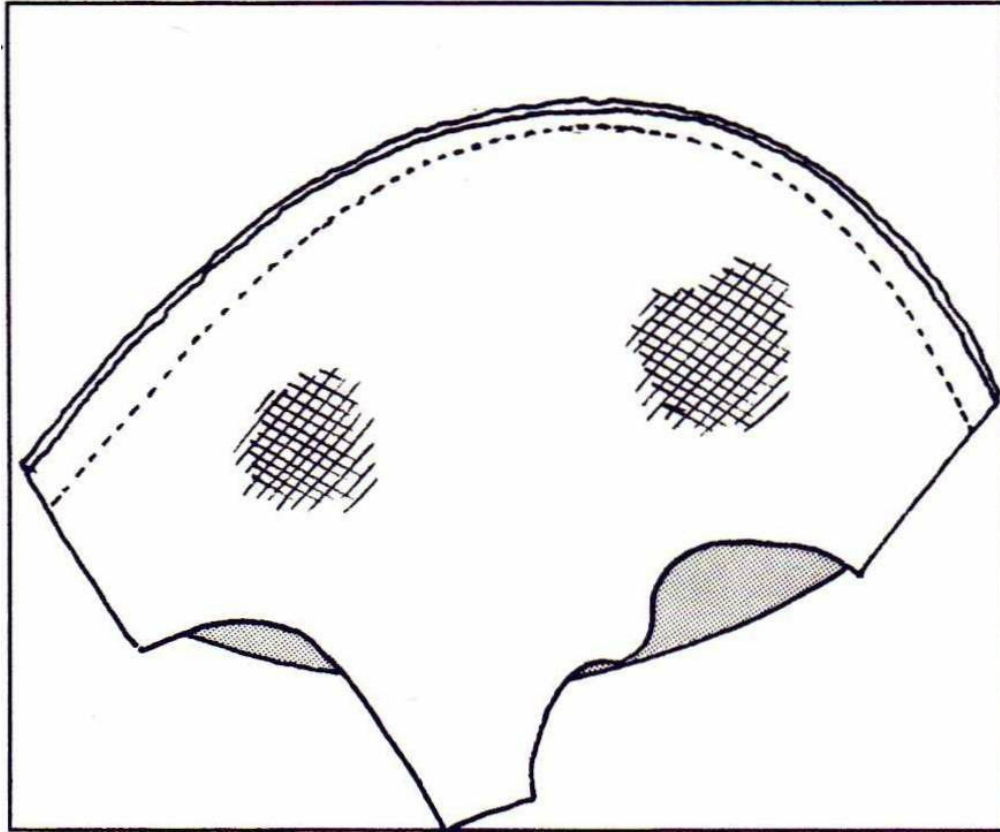
## One Breast Larger Than the Other

### ***8 What can I do if one breast is slightly larger than the other?***

This problem is very easily overcome if one breast is just a fraction larger than the other. Obtain a pattern bra that fits the smaller breast beautifully and is just a fraction too small for the fuller breast. Draft the pattern of the bra, and sew the bra as usual, but when it comes to sewing the cup for the larger breast, decrease the seam allowance across the central cup seam(s) i.e. when sewing the central cup seam, begin sewing it, using the full seam allowance allowed on the pattern, but then taper/ decrease the seam allowance so that only about a third of the seam allowance is used at the tip of the cup.

When approaching the other end of the seam, gradually use more of the seam allowance again so that at the end of the seam, the full seam allowance has been taken. In this way, that cup will end up having slightly more cup space, catering for the slightly larger breast, but as the full seam allowance has been taken at either end of the seam, the length of the cup's wire line seam will not be interfered with.



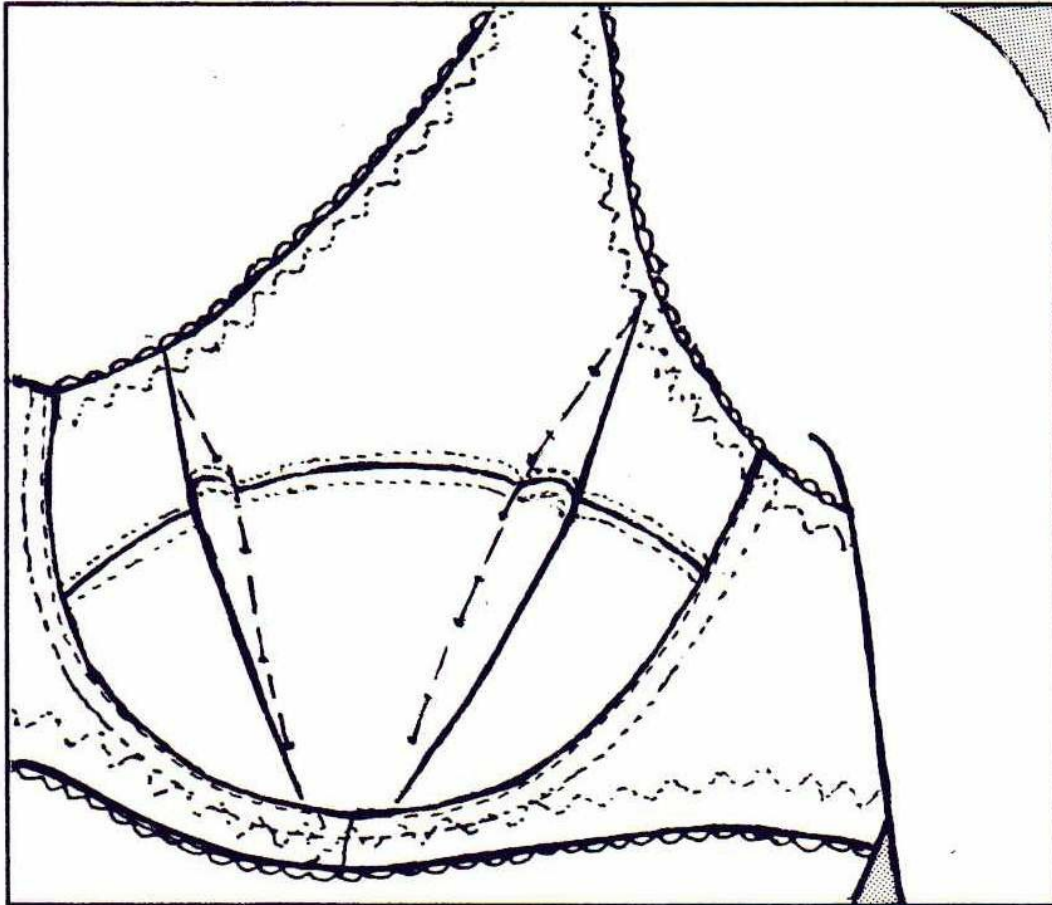


### ***9 What can I do if one breast is much larger than the other?***

Because one side of our body is not the mirror image of the other side, most people have one foot larger than the other, and most women have one breast larger than the other. This naturally-occurring difference is mostly very slight, but sometimes the size discrepancy is significant. Many women who have been through the trauma of breast cancer can be left with this residual cosmetic problem as well. (I have seen some very ill-fitting prostheses!) Here are a few solutions to this problem.

- Produce two cup patterns. Obtain a pattern bra that fits the larger breast beautifully and pin darts into the other cup so that it is a snug fit on the smaller breast (refer to [pages 51 to 53](#)). The cup patterns are then drafted: the original cup pattern that fits the larger breast, and the darted cup pattern that fits the smaller breast. When sewing a bra that contains two cup patterns, care must be taken to cut the cup pieces out using a single layer of fabric, and to label all of the left breast and right breast cup pieces as such, so that if it is not

patently obvious which is the right side of the fabric, the cup pieces will not become mixed up between the two cups (ie. avoid sewing the left breast's upper cup to the right breast's lower cup and vice versa). The one disadvantage with this method is that while producing two beautifully fitting cups the size discrepancy between the two breasts may be noticeable, especially if fitted clothes are worn.



- Produce one cup pattern that fits the larger breast beautifully, but which will be too big on the other breast. Cut the bra out and sew it normally, but when it comes to sewing the cup for the smaller breast, incorporate padding into the cup: either just pad the lower cup to lift the breast within the cup, or pad both the upper and lower cup sections. If padding the lower cup, a removable, elliptical padded shape with a corresponding pocket can be used to maximise the padding without increasing the seam-line bulk. The amount of

padding, and its distribution within the cup will depend on just how much difference there is in the size of the two breasts. This method is particularly useful in making bras for women who have had lumpectomies, mastectomies, partial breast reconstructions and breast reconstructions that have left a noticeable breast size discrepancy. Because of the padding in the smaller breast's cup, the size discrepancy is beautifully disguised, helping to restore confidence and assurance where it is most needed

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## The Bra Back Rides Up

### ***10 What can I do if the back of my bra always rides up?***

This problem is caused by the fact that bra backs in manufactured bras are both badly designed and made from mediocre-quality fabrics. Because of this, the bra back fabric has to stretch to its maximum extent every time the bra is worn, and it loses elasticity very quickly, giving only a few months of optimum wear. The slack, over-stretched bra back causes the bra to be too loose around the ribcage, even when done up on the tightest set of eyes, and the breasts droop forward, pulling the slack-fitting bra back upwards as they do so. To obtain uplift, we then tighten the straps, which only pulls the bra back further up our backs.

If your breasts are large and heavy, and/or your ribcage is quite cylindrical (i.e. your torso doesn't get much narrower at the waist) then these bodily characteristics will predispose your bra backs to riding up. In these instances, it vital that your bra backs be well designed so that this problem will not occur.

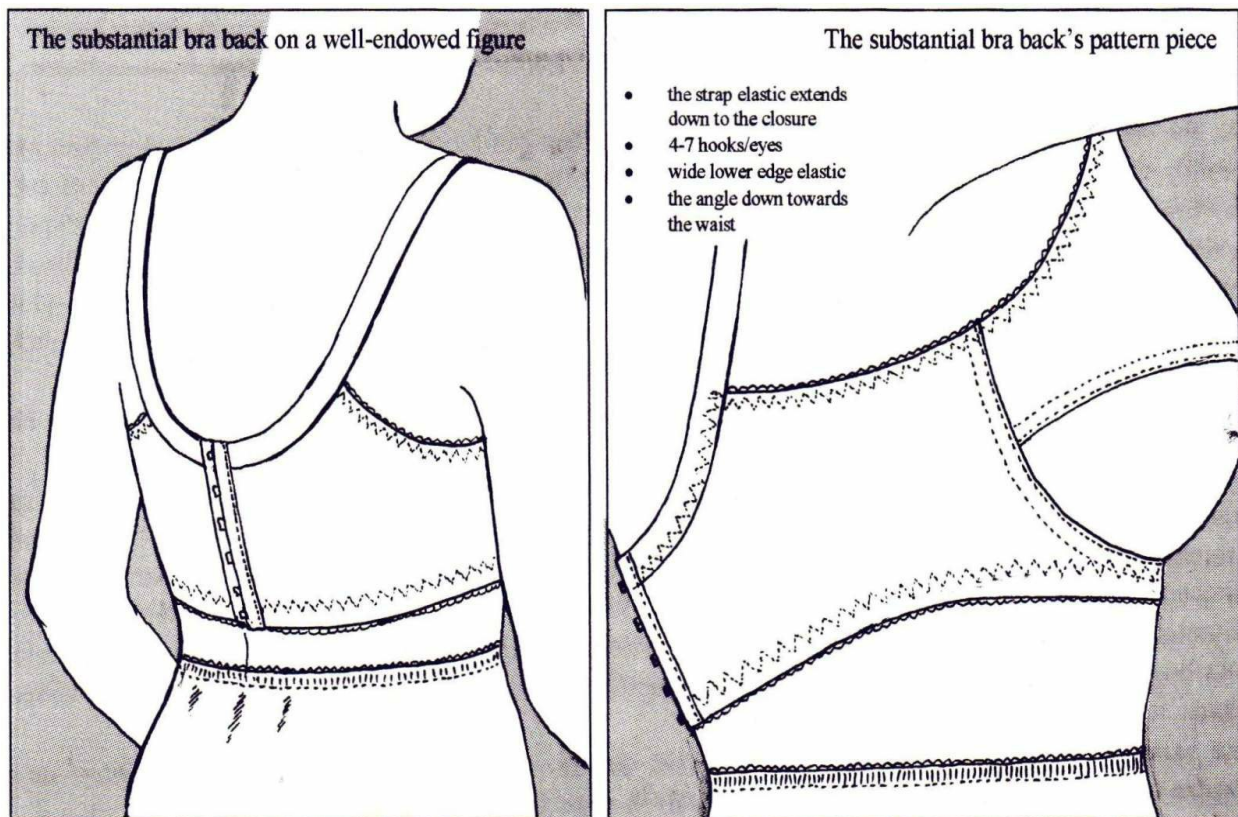
As you can see, the support that a bra gives relies just as much on the bra back as it does on the cups, and to be successful, a bra back should be both ***strongly constructed as well as being substantial in its design.***

Concerning the construction of the bra back, this very much depends on the kind of fabric used. If you wish to use a better quality fabric in the backs of your bras, or are interested in self-lining the bra back, refer to [pages 20 to 22](#). Skimping on fabric quality and fabric quantity in a bra back is definitely a

false economy when making bras.

Concerning the design of the bra back, the type of bra back that will be most successful in overcoming this problem will be a **regular style of bra back**, (having the bra strap sewn to the edge that leads down to the closure edge), and it will have:

- a lower edge that is angled downwards, the steep angle beginning from the underarm area and continuing on until the closure edge is reached. This angling down of the shape of the bra back is critical to its success, as it utilises every bit of waistline tapering that is present in the ribcage,
- an angled closure edge ... this will cater for the tapering-in of the ribcage down near the waist, and
- an increased overall height in the area of fabric taken up by the pattern piece. The following diagram illustrates a bra designed with a substantial bra back.



## ADVANCED PATTERN MAKING

The quickest but above all, the most accurate technique for drafting a bra pattern is to follow the pattern making instructions already given ([page 10](#) and following). Cutting the bra up like this will entail sacrificing the pattern bra, but the sacrifice is well worth it, as its demise results in many new bras that are made at a fraction of the full retail price. For those of us whose best fitting bra is either new or relatively new, and who don't want to immediately sacrifice it in order to obtain an accurate bra pattern, you have the option of ***wearing it for 12 to 18 months or so before cutting it up.***

Some women try to draft their bra patterns by ***unpicking their favourite bra***, in the mistaken belief that after its pattern is drafted, they will be able to sew it back together again ... an enterprise much more easily contemplated than carried out, especially if you haven't sewn a bra before. Unpicking a bra in order to draft its pattern, whilst being an extremely time-consuming exercise, it is not nearly as easy nor generally as accurate as cutting the bra up along its seam lines, tracing the pieces and adding your own seam allowance. The problem with unpicking a bra, is that once the stitching is removed and the individual fabric pieces flattened, it is very difficult to know the exact position of the seam lines. It then becomes a matter of scrutinising the needle holes in the fabric in order to determine where the pieces of fabric actually met. If you have decided to unpick your bra rather than cutting it apart, then it is absolutely necessary that you:

- use a water-soluble felt-tipped fabric marking pen to label each section of the cup,
- write directional markings on each part of the cup, and
- draw over all the seam lines before the bra is unpicked. Note that a seam line is where one piece of fabric meets another piece of fabric.

When this is done, you will not 'lose' the seam lines, and you will know exactly what all the pieces are and how they fit together.

However, if you are unwilling to tamper with your bra in any way and yet you would like to draft its pattern immediately, the following micropore-over-the-cup technique can be used. It is also a pattern making technique that can be used to convert an intact stretch-fabric-cupped bra into a non-



stretch cup fabric bra pattern.

## Micropore-Over-The-Cup Technique

### ***Producing a bra pattern from an intact bra or converting a stretch fabric bra cup into a non-stretch cup bra pattern***

As the centrepiece and back sections of a bra lie flat, they can be traced fairly easily and their patterns readily obtained from an intact bra. To obtain a cup pattern from an intact, three-dimensional bra cup however, is very difficult. Taking on this challenge, I have devised the Micropore-over-the-cup technique: a single technique that is useful for obtaining the cup pattern from an intact bra, as well as for producing a pattern for a non-stretch fabric cup that is nearly identical to an intact, stretch-fabric bra cup. This technique has risks associated with it, and is therefore not a guaranteed technique. Its success very much depends upon the skills of the friend that you will need to enlist to help you in this enterprise.

***Whatever your reasons for using this technique, the cup pattern that you will end up with is to be used with non-stretch cup fabric.***

The main reason for converting a stretch fabric cup into a non-stretch fabric cup, is to extend your cup fabric options. Take for example, the situation where your bra cups are made out of nylon lycra and stretch lace. You have successfully drafted your bra pattern, and cloned your original pattern bra a number of times, however the range of nylon lycras for sale is limited: there is not the interesting variety of patterned and embossed nylon lycras that you would like to be able to choose from. So to translate your bra cup so that its pattern can be made using non-stretch fabric and laces produces a much wider choice of suitable cup fabrics and finishes.

***Bra patterns designed for non-stretch cup fabric are the most versatile bra patterns as almost any bonded lace or bonded knit fabric can be used as the cup fabric.***

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You will notice that I have deliberately omitted to mention a woven fabric as a suitable non-stretch cup fabric. The most important reason why woven



fabrics are generally unsuitable for use in bra cups is that they will not conform to the curved surface of the breast in the way that a knit fabric will. Woven fabrics tend to pull tightly in areas across the surface of the cup, according to the direction of the straight grain in the fabric.

I only use woven fabrics in bra cups when the original pattern bra itself has woven fabric in the cups. These bras are generally older bras and they have cups comprised of woven cotton.

To create a non-stretch cup fabric that is both fine and strong, fuse almost any fine knitted fabric or fine lace to rigid stabiliser using a light-weight fusible webbing. It is of no consequence if the fine knit or lace contains give or stretch, as any undesired give or stretch in the outer cup fabric/lace can be almost completely cancelled out by the rigidity of the rigid stabiliser.

To produce your non-stretch fabric cup pattern, work through the following instructions:

- Purchase some rolls of Micropore tape in a variety of widths if possible (a width range of approximately 1.5cm to 2.5cm. or 1 inch to 2 inches is perfect). Micropore tape is an inexpensive, non-stretch, white, papery, adhesive bandaging available from chemists/drugstores. It is commonly used in hospitals, as while being adhesive, its adhesive nature isn't so strong that it traumatises the skin when it is removed. A range of widths in micropore is good to have on hand: the wider tape being good for sections of the cup that are relatively flat or two dimensional, and the narrower widths are excellent for areas of the cup that have a more curved/rounded surface (more three-dimensional).
- Enlist the help of a friend who is proficient at sewing or pattern making.
- While you are wearing your bra, get your friend to ***tear off strips of Micropore that are about 3 or 4 inches (8-10cm) long, and one-by-one, lay them gently onto the surface of the left breast cup.*** When laying the overlapped strips of tape onto the surface of the cup, take care not to pull them tight. Simply lay them onto the surface of the cup and smooth them out flat so that they adhere to the cup fabric. Forcing the tape to go in a certain direction will create undesired

distortion of the cup-shape. Let each piece of tape find its own course on the surface of the cup ... don't try and force it to go where you think it should.

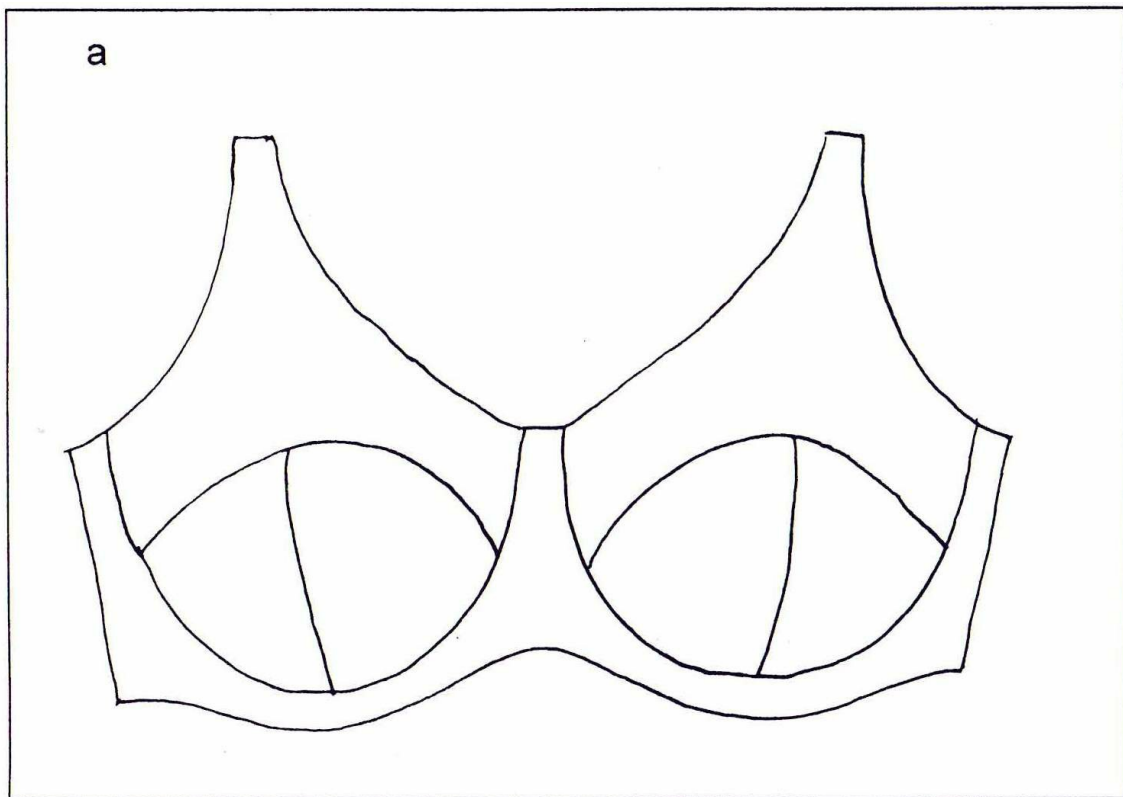
- Keep applying the overlapped strips of tape until they frilly cover the cup and the micropore is about two or three layers thick. There should be sufficient overlapping of the strips of tape to stop the micropore cup coming apart or distorting when it is later peeled off the bra cup.
- Using a felt-tipped marker, ***draw the neckline and armhole edges of the underlying cup onto the micropore cup.*** To determine the exact position of these edges, you may have to slightly peel back the edges of the micropore cup.
- Using a felt-tipped marker, ***draw the wire line seam onto the micropore cup.*** Again, the bottom edges of the micropore cup may have to be peeled upwards slightly in order to determine the exact position of the wire line seam. All outer edges of the underlying cup have now been drawn onto the micropore cup.
- The next stage in this process is to ***draw some new seam lines onto the micropore cup*** using a felt-tipped marker. The new seam lines that are to be will probably be in completely different positions to the cup's original seam lines, and design of the cup will also be radically different.

When drawing/positioning the new cup seam lines, the first thing to do is to choose a three-or-more-piece cup style from the following selection, and then to draw the chosen style's seam lines onto the surface of the micropore cup. ***The aim is to 'facet' the cup shape*** in the way that a jeweller would facet a precious stone, choosing the overall style of the gem to suit its shape 'in the rough.' Remember that:

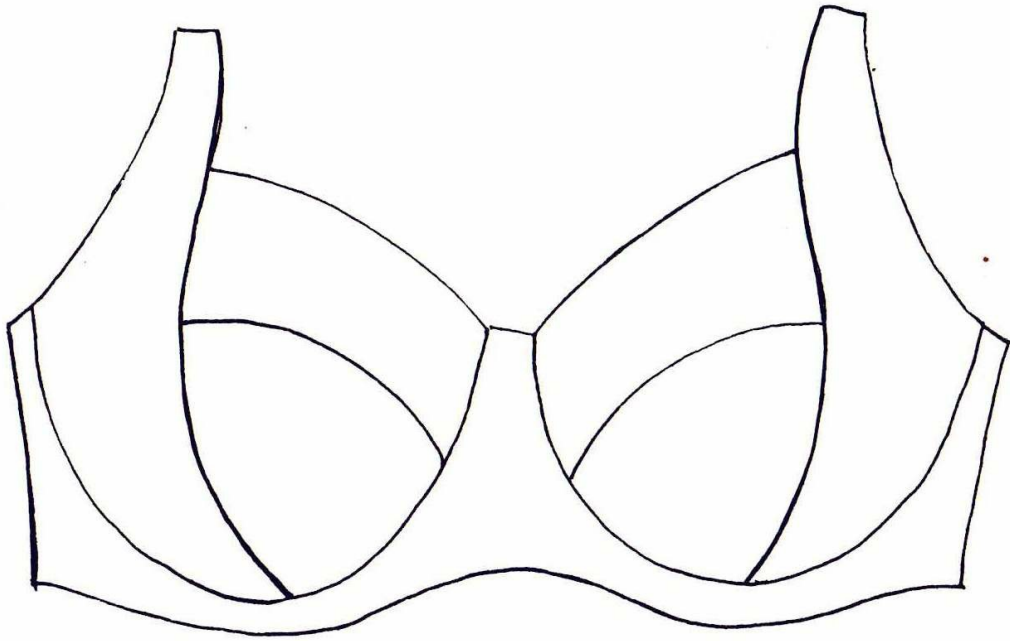
1. the greater the number of facets/cup pieces, the more rounded the cup surface will be, and therefore, the more successful your new cup pattern will be.
2. where the surface of the cup is the most rounded/three-dimensional (this is generally at the tip or point of the cup), that is where the most number of smaller cup pieces are needed.

The following diagrams are a selection of possible cup styles that you may like to choose or take inspiration from. They have three or more cup pieces, making them look rather unusual as a bare line drawing, but when they have been sewn, using for example, a bonded lace throughout the cup, the seam lines will barely be noticeable - only the rounded overall shape of the cup and the attractive pattern of the lace will be apparent.

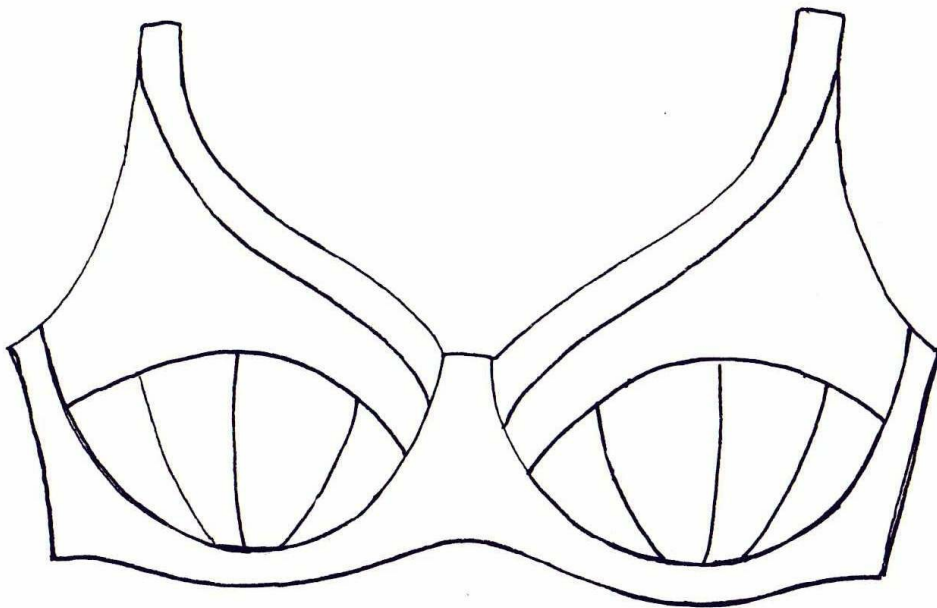
[page 70]

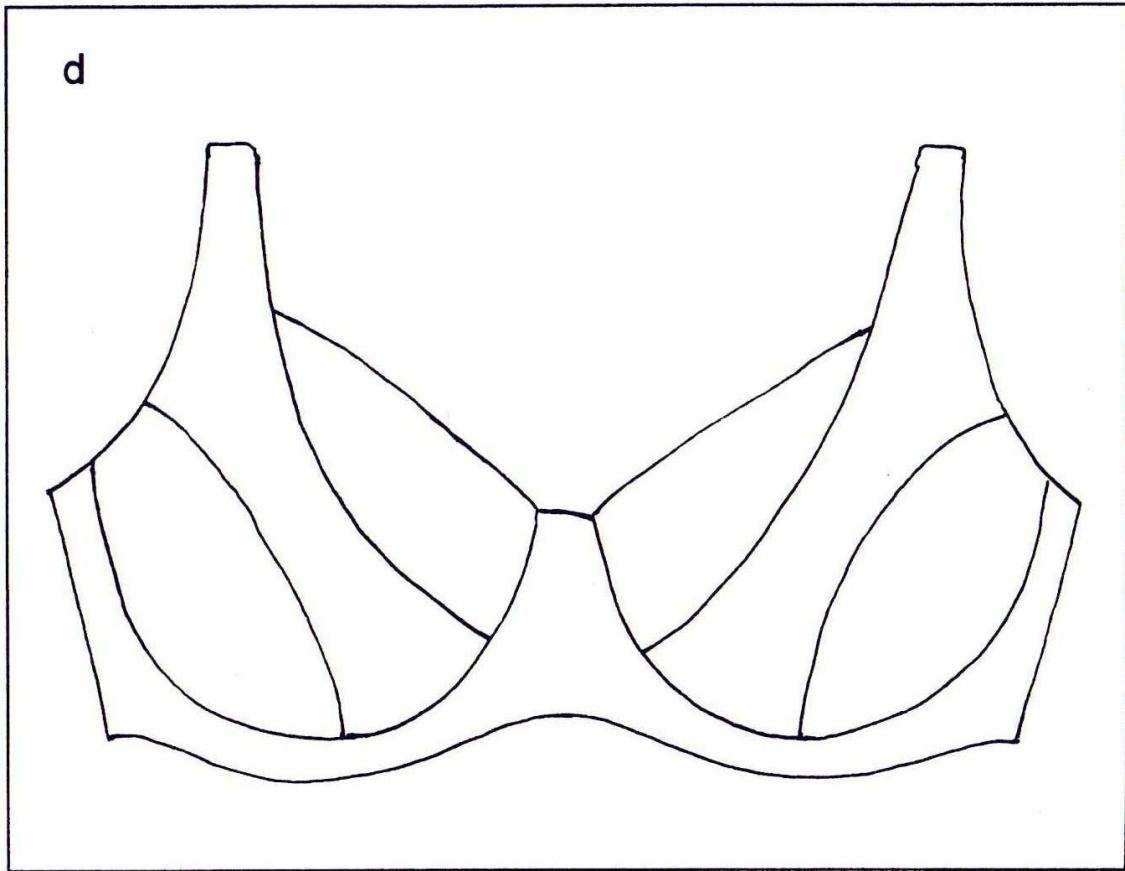


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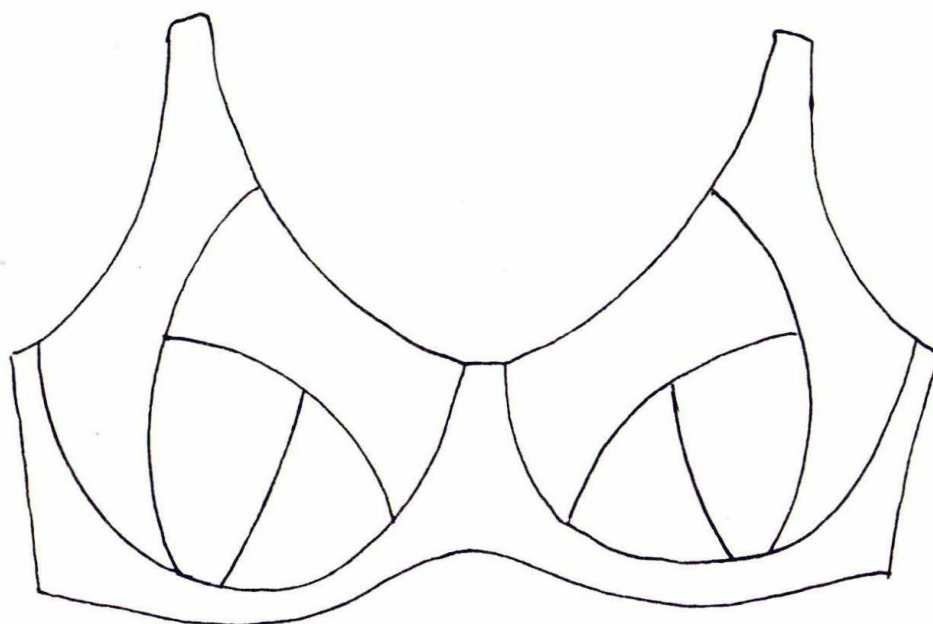


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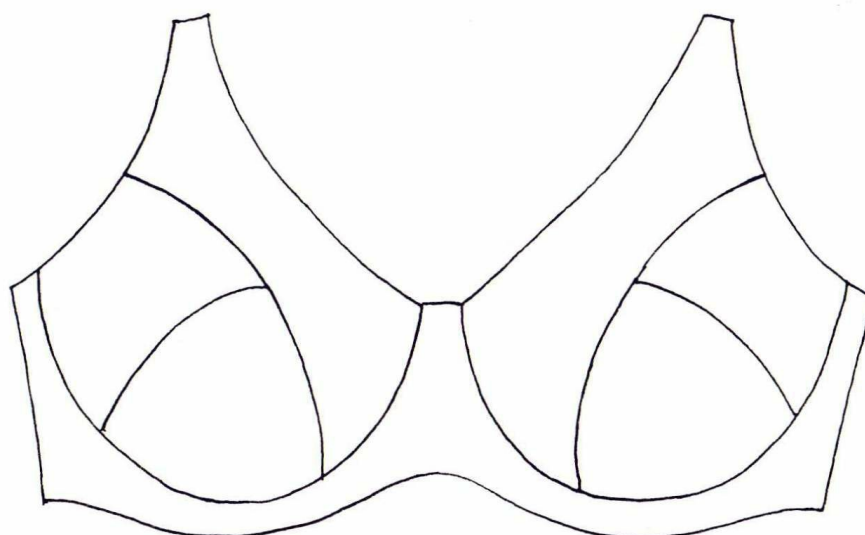




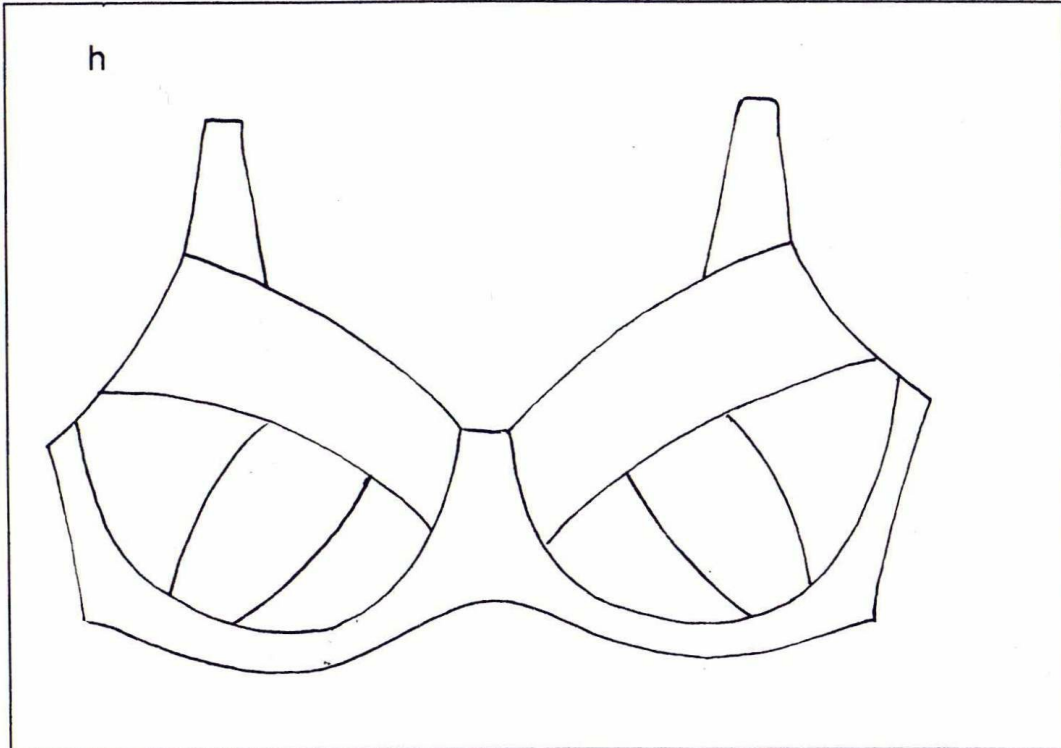
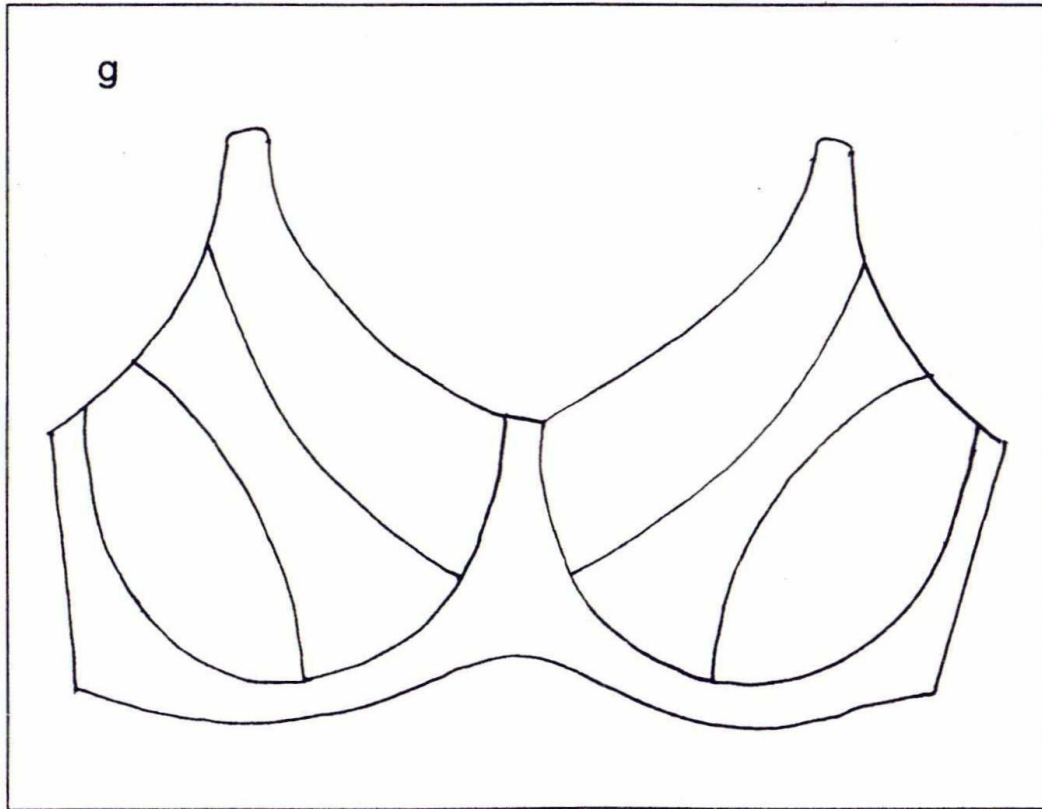
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f







- Once the new seam lines have been drawn onto the micropore cup, ***label each section of the cup*** using the letters A, B, C etc.
- Draw a similarly labelled diagram of the particular cup style you are using. Use one of the templates found on [pages 10](#) and [11](#).
- The micropore cup can then be carefully peeled off the bra cup.
- Trim the overhanging tape pieces back to the finished edges of the cup (the neckline and armhole edges and the wire line seam).
- Label Centre, Side and Top of each cup piece (use a small C, S and T).
- Cut the micropore cup up, cutting along the new seam lines and re-stick each section onto a stable, flat surface such as a desk top or a large kitchen cutting board. If any edges curl upwards slightly, forming a shallow 'cup', cut tiny nicks along the problematic edge(s) to get it lying flat on the surface.
- Accurately trace each section of the micropore cup onto a piece of pattern making fabric. Write the small directional letters (C, S and T) and the labels for each section onto the pattern pieces.
- Add 1cm seam allowances around each traced cup section (except where there is a self-edged neckline), and cut around finished cup pattern pieces. Check relative seam lengths and mark appropriate easing stitches onto cup seam lines as needed. Refer to [page 35](#). The new non-stretch cup pattern is now complete.
- To obtain the centrepiece pattern, refer to [pages 12](#) and onwards.
- To obtain the bra back pattern, I suggest tracing the left body-side bra back when the underwire in the left breast cup is in a splayed position (when the central and side uprights of the wire are stretched apart: the way they become when the bra is worn on the body). Refer to [pages 20](#) and onwards. When splaying the underwire like this, it may help if you pin the bra to an ironing board.

## The Challenge of a Moulded Cup (Without a Seam)

Some of the cups in manufactured bras are seamless. In the manufacturing process, the cup fabric is stretched over a breast mould and heat-treated so that the fabric stays in the shape of the mould. As a home sewer, we have neither the technical expertise nor the equipment to replicate this process. This is one of the most difficult bra patterns of all to draft successfully, but it is certainly worth the attempt. You can make cups nearly the same size and

shape as the moulded cups but you have to use **a diagonal cup seam**, as the cups you make will be made using two flat pieces of material seamed together.

Mostly the cup fabric in moulded cupped bras is double-knit tricot, but occasionally it is nylon lycra.

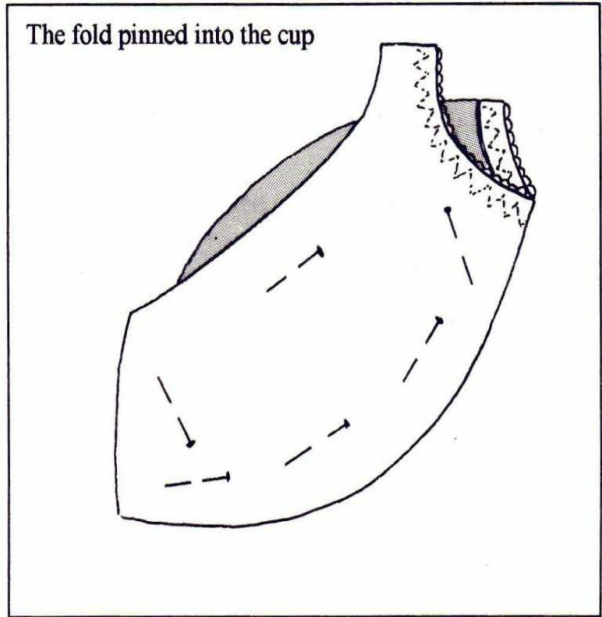
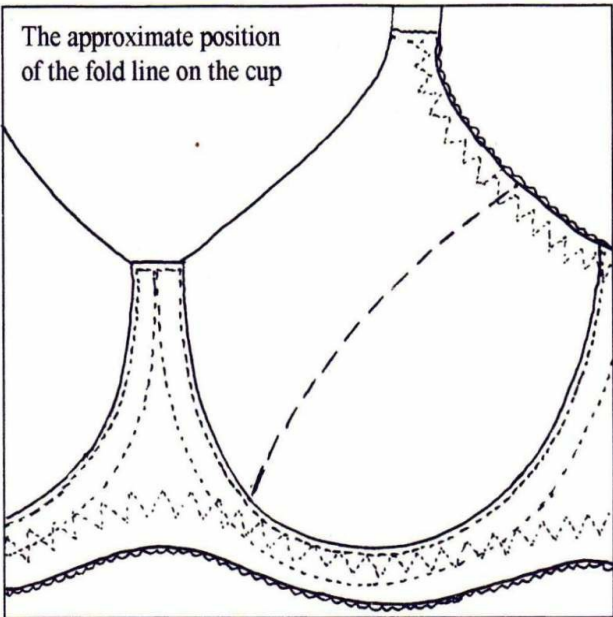
**If the moulded cup fabric is double-knit tricot, then it is possible to draft the cup pattern**, but if the moulded cup fabric is nylon lycra, then the only way of drafting its cup pattern is to use the micropore over the cup technique.

If the original cup fabric is double-knit tricot, then when making your bra cups in future, also use double-knit tricot. For use in later experimentation, an alternative cup fabric is stretch lace, lined with either single-knit tricot or mirror satin (one-way stretch knitted satin).

To obtain the centrepiece and bra back patterns of your moulded cup bra, follow the previous instructions ([page 12](#) and onwards).

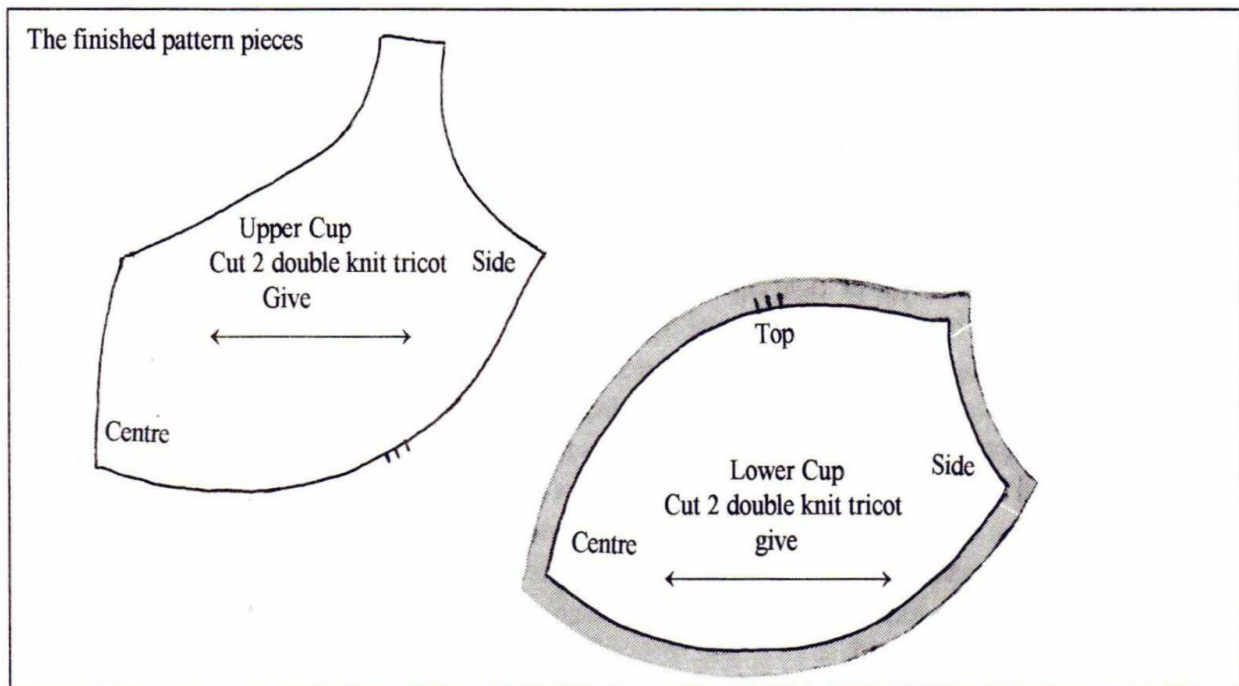
To obtain the cup pattern of a moulded-cupped bra, use the following method.

- **Carefully cut the left breast cup out of the bra**, cutting exactly along the wire line seam using a very sharp pair of scissors.
- To find the best and most natural cup seam line **fold the cup in half so that the fold line goes diagonally across the cup and passes through the centre of the nipple area**. Next diagram on the left. Experiment by folding the cup along slightly different diagonal angles. You are looking for the natural fold line: the one that will produce the two flattest cup pieces on either side of it. This natural fold line will become the central diagonal cup seam line.



- Once you have decided on the most natural diagonal fold line, pin the cup together so that the fold cannot move, and using a fine point felt-tip pen **draw a line right along the fold of the cup fabric.** Diagram above right. To guard against any confusion, mark the central fold line/seam line using three straight lines drawn at right angles and through the fold line.
- Remove the pins, open the cup out flat, and carefully cut the cup into two pieces along the fold line that you have just drawn.
- Taking care to ensure that the lower cup piece is the right way up, label the top, side and centre of the lower cup by writing small letters T, S and C onto the cup fabric.
- Iron both the upper and lower cup pieces with a warm iron to flatten them.
- Accurately trace around the very edge of the new upper and lower cup pieces using pattern making fabric and transfer all directional letters to the pattern (T, S and C).
- Add an exact 1cm seam allowance to all the edges of each piece.
- This cup pattern is to be initially made using double-knit tricot. Because of the way the cup fabric was initially stretched so tightly over the breast mould, I have mostly found that at the tip/point of the cup, all give in the cup fabric has been eliminated. Around the edges of the mounded cup, I have mostly found that the greatest

give in the tricot seems to go in all different ways. This makes it very difficult to decide how to orientate the greatest give in the new cups that are to be sewn. When I have previously drafted one of these patterns successfully, I used the direction of greatest give in the double-knit tricot running more or less horizontally on both the upper and lower cup pieces. Diagram below.



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## Converting One Bra Style Into Another

### **CHANGING THE STYLE OF THE CUP**

Once you have successfully sewn a bra using either a commercial pattern or a pattern derived from your best fitting bra, you may wish to try a new cup style. The best and most successful way of drafting a new style of bra cup pattern is to 'shop around' until you find a different style of manufactured bra that fits well in the cup. ***Purchase that new style of bra and draft its pattern*** according to the pattern making instructions already given.

If finding a new style of bra cup like this is impossible, you can experiment with altering your bra's cup style using the micropore over the cup technique ([page 68](#)), drawing new seam lines onto the micropore cup before

it is peeled off and cut up.

Alternatively, if your original bra cup was made out of non-stretch fabric/lace, you may like to construct an experimental cup, using the original bra pattern and a non-stretch fabric. If you intend to lower the centre front neckline edge, ensure that the top edge of the centrepiece pattern is accordingly lowered if the two finished edges originally joined to one another. Fold your experimental cup roughly in half along various angles, searching for a natural seam line (similar to the method described on [pages 72 and 73](#)).

The fold line that is the best is the one that produces the two flattest cup pieces. This fold line is converted into a seam line: the experimental bra cup is cut into two. If one of the pieces won't quite sit flat, it too can be folded into two halves (or even three sections if desired), along its natural fold line, creating a three or four piece cup. Review the styles found on [pages 70 and 71](#) to expand your style ideas. Once you have decided on the positions of the fold lines (seam lines), use a fine, felt-tipped pen to draw a line along the folds. Carefully cut the cup along the lines, label the individual pieces, indicate the top, bottom, centre and side of each cup piece, draw a diagram of the new style of the cup, and trace the new cup pieces onto pattern making fabric, adding a seam allowance along the seam lines.

## Converting an Underwired Bra Into a Non-Underwired Bra

It is important to know which underwired bras will function reasonably well without their under-wires. This is especially important if you are large-busted, can't find a non-underwired bra in a larger cup size that fits you, and don't like wearing underwired bras. Because there is a much larger range of underwired bras available, knowing which ones can do without their underwires will extend your options when looking for a pattern bra.

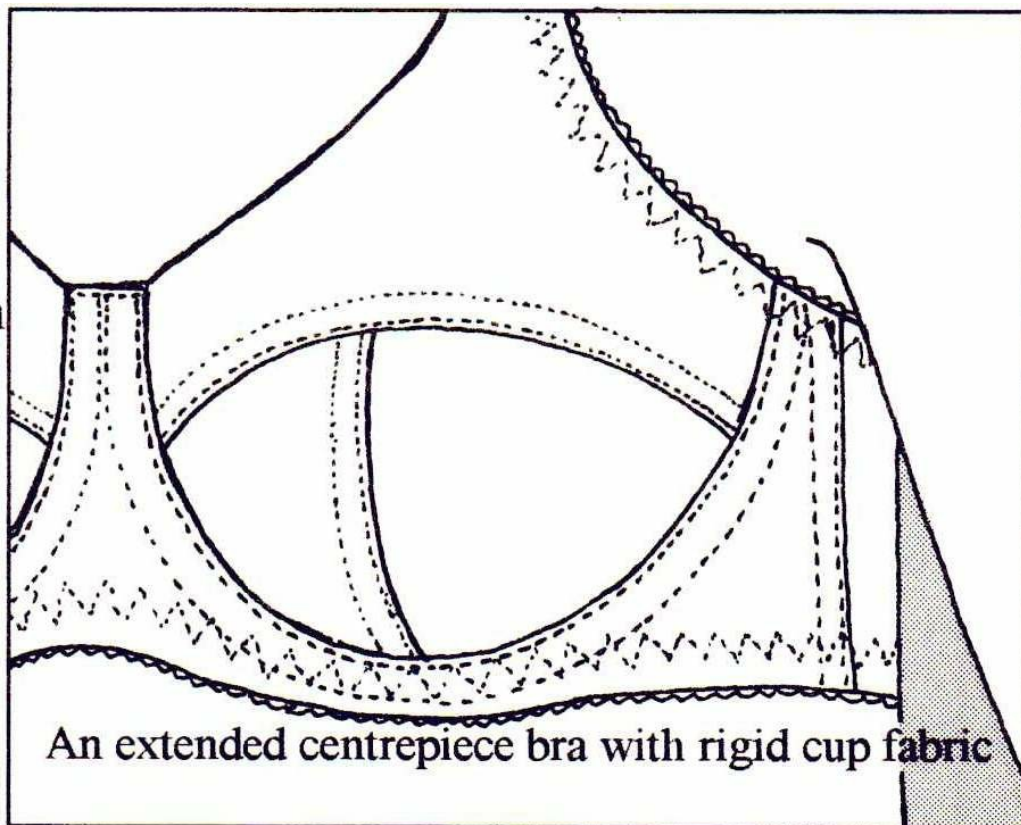
***There is only one type of underwired bra that functions reasonably well without its underwires:***

- ***It must be an underwired bra that has a band of fabric going across the front of the bra underneath the cups.*** Where the bra body extends across the front of the ribcage under the cups, it forms a narrow 'band' under the cups, stabilising the cups and maintaining



the structure of the bra if the underwires are removed. Most underwired bras have such a band under the cups, being either a Y centrepiece style or an extended centrepiece style.

- ***It must be an underwired bra that contains rigid/non- stretch cup fabric.*** The type of rigid cup fabric commonly used in non-stretch bra cups is either lace or tricot bonded to rigid stabiliser. Rigid stabiliser is the non-stretch nylon knit fabric used in the pockets of men's manufactured trousers. The three-dimensional shape of the cup is fully formed, and all the breasts have to do when such a bra is, put on, is to sit out into the fully-formed rigid cup. Because the cup fabric is the shape of the cup is also fixed, making its form less susceptible to collapse once the underwire is removed.



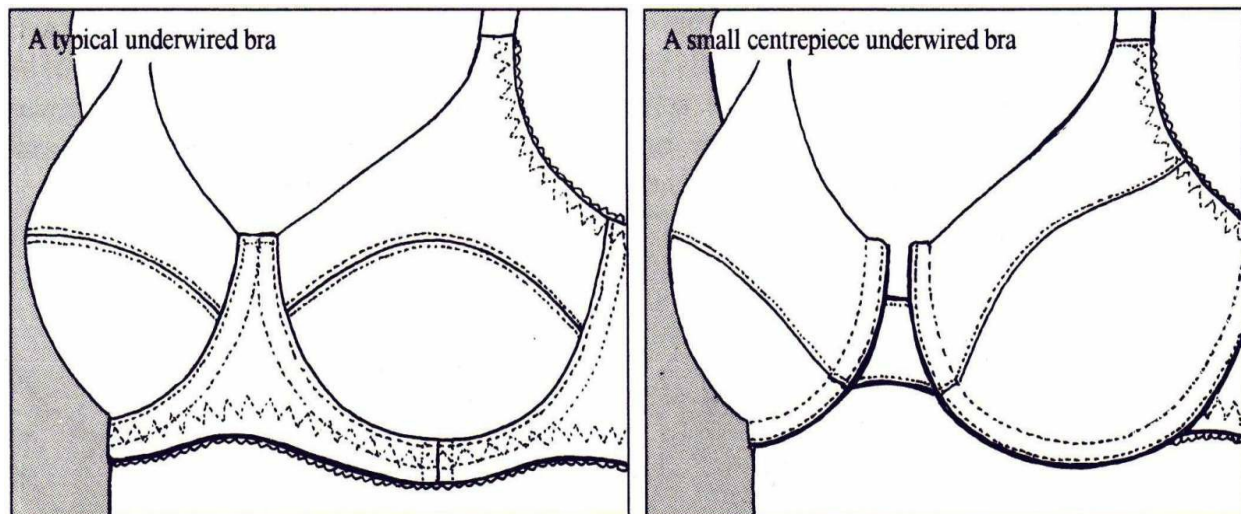
[page 75]

## Adding or Subtracting the Band Under the Cup in an Underwired Bra

Consider a typical underwired bra similar to the one in the diagram below

left. It has two main sections: the cups and the bra body (the bra body is everything in the bra beside the cups: the centrepiece and the bra back). Where the bra body extends across the front of the ribcage under the cups, it forms a narrow 'band' under the cups. ***Most underwired bras have a band under the cups, and are either a Y centrepiece style or an extended centrepiece style.***

***Small centrepiece bras do not have such a band and the underwires themselves are the lower edge of the front of the bra.*** They are similar to the bra in the diagram below right. This style of bra is called a small centrepiece style bra simply because the non-stretch centrepiece that joins one cup to the other, is much smaller in size.



The situation can arise when you would like to convert a bra that has a band under the cups into a small centrepiece bra, or alternatively, you may want to convert a small centrepiece style into a style that has a band under the cups.

***Converting a bra that has a band under the cups into a small centrepiece bra will create a bra style that can appear more alluring or romantic.***

Making this pattern conversion is especially applicable for large-breasted, young-at-heart-women who are tired of their functional, unimaginative, 'full figure' bras.

***Converting a small centrepiece bra into a style that has a band below the cups can accomplish two purposes.***

- ***Firstly, it will create a style that has a deeper lower edge under the side of the cup.*** Having a deeper lower edge is an advantage when altering the shape of the bra back in order to prevent the bra back from riding up. (It is much easier to angle the closure edge of the bra back significantly downwards towards the waist, if the lower edge under the side of the cup is already fairly low on the body).
- ***Secondly, it will create a bra that can function reasonably well without its underwires.***

A bra that has a band under the cups can provide a moderate amount of support and uplift without its underwires, provided that the cup fabric is rigid/non-stretch in nature. The band under the cups helps the cups to retain their position, shape and stability when the underwires are removed from the casing. The small centrepiece bra however, totally relies on its underwires to offer support and uplift. Without its underwires, a small centrepiece bra tends to lose all of its structure and 'collapses'. This is why a small centrepiece bra is exclusively an underwired design.

[page 76]

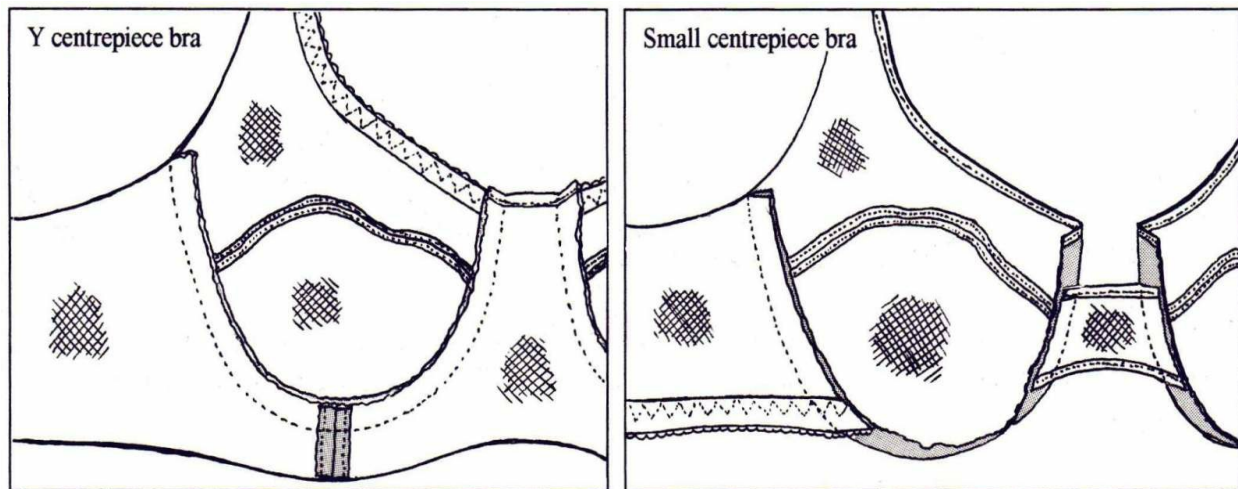
To understand the way a bra pattern is altered to make these two types of style conversions, it is necessary to understand how the components of these two types of underwired bra are assembled.

An underwired bra has two main components: the cups and the bra body (the bra body is everything in the bra beside the cups). The seam that joins each cup to the bra body in an underwired bra, is called the wire line seam.

Assembling a typical underwired bra (a Y centrepiece or extended centrepiece bra) is basically similar to the way a tailored jacket is assembled. When making a jacket, the body of the jacket is made, the sleeves are made and then the sleeves are inserted into the armholes in the body of the garment. When assembling a typical underwired bra, the bra body is constructed (the centrepiece is sewn to the bra back), the cups are constructed and then the cups are inserted into their cup spaces in the bra body. The wire line seam, (where each cup is joined to the bra body) is one complete seam line that goes around the curved, lower edge of the cup. The

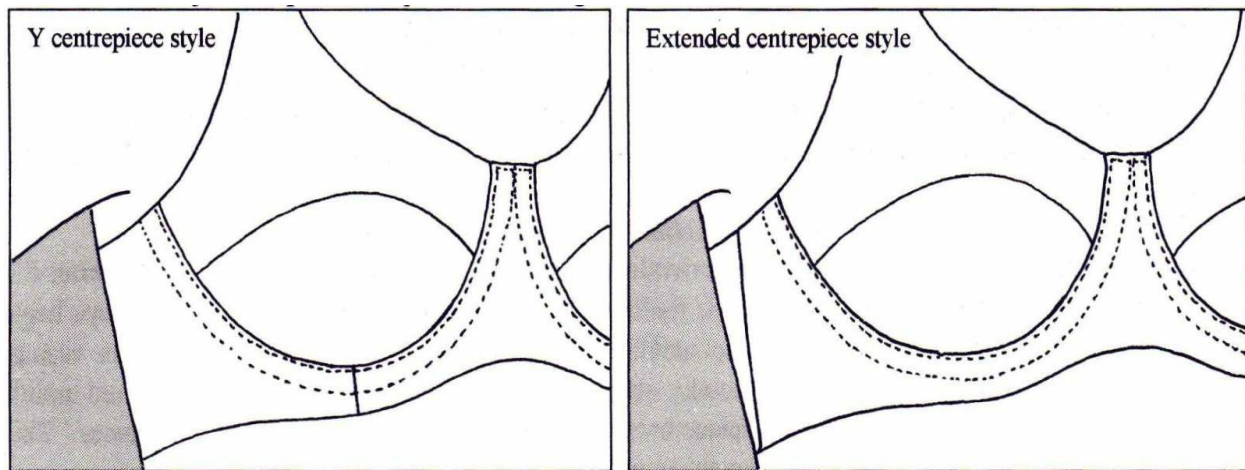
diagram below left illustrates the cups sewn to the bra body in a typical Y centrepiece underwired bra. This diagram shows the partially sewn bra when viewed from the inside.

In a small centrepiece bra, the bra body consists of two separate pieces: (the small centrepiece and the bra back) which must be sewn to each cup in their correct positions. The wire line seam is accordingly broken into two separate sections. The diagram below right illustrates the cups sewn to the bra body in a small centrepiece bra. This diagram shows the partially sewn bra when viewed from the inside.



***The raw edges created by the wire line seam can either be turned out of the cup to be top stitched down, or they can be turned into the cup to be top stitched down.***

- In a Y centrepiece style or extended centrepiece style, the wire line seam raw edges are usually turned out of the cup to be top stitched. Diagrams below.

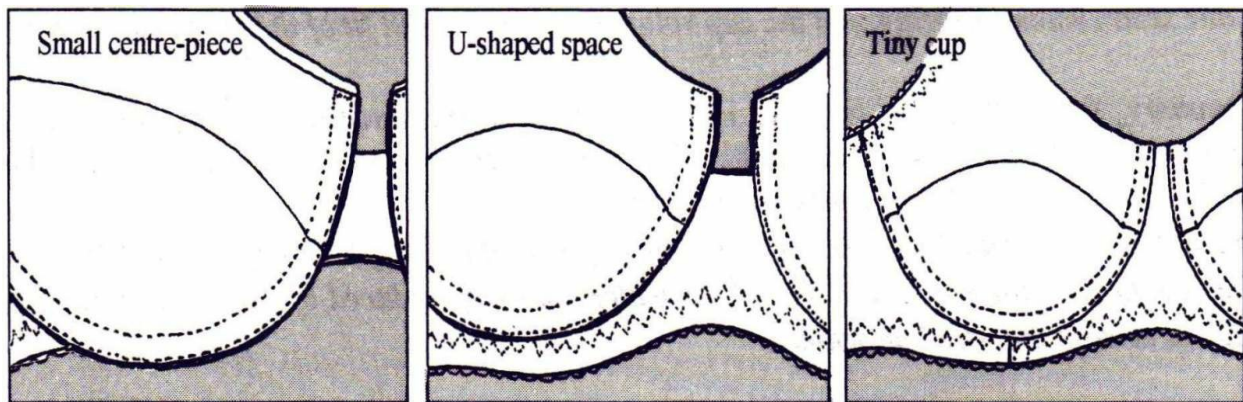


[page 77]

***In a small centrepiece bra, the wire line seam raw edges must be turned into the cup*** to be top stitched. This is always the case wherever there is an exposed section of the cup's edge/an exposed length of the cup's wire line seam (a part of the edge of the cup that is not joined to the bra body). The bras in the left and centre diagrams below are examples of styles that ***must*** have their wire line seam raw edges turned into the cup in order to conceal these raw edges in the finished garment.

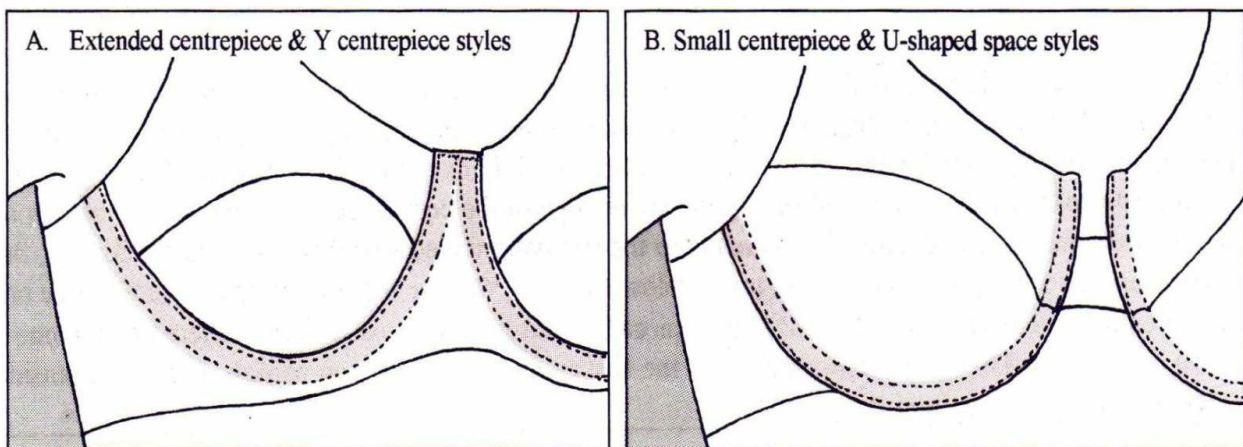
In the small centrepiece bra (on the left), there is no bra body under the cups to top stitch the raw edges out onto. So they have to be turned into the cup. In the bra with the U-shaped space at the centre front, the top edge of the centrepiece is lower than the neckline edge of the cup, making it again necessary to turn all the raw edges into the cup so that they can be concealed in the finished bra. In the diagram below right, is a bra that appears to be a regular Y centrepiece bra, but its raw edges have been turned into the cup to be top stitched (the opposite to what you would expect). This bra has a very small cup size being a small A or B cup size, e.g. 32A (10A). Because of its small cup size, the curve of this bra's wire line seam is a very 'tight' little curve. Having the raw edges go into the cup makes this size of bra easier to construct when it comes to applying the underwire casing. It is a lot easier to turn the raw edges into the cup onto an even smaller curve, than to excessively stretch the raw edges by turning them out of the cup: out onto a much longer, wider curve. A tiny cupped bra like this is 'the exception rather than the rule'.





When comparing two bras that have the wire line seam raw edges turned in opposite directions, one into the cup and the other out of the cup, ***the position of the top stitching will indicate the direction in which the raw edges are turned.***

- Where the raw edges are turned out of the cup, the top stitching will lie outside of the cup (being sewn through fabric belonging to the bra body, outside of the wire line seam). Diagram A - below left.
- Where the raw edges are turned into the cup, the top stitching will lie inside the cup (being sewn through cup fabric, inside the wire line seam). Diagram B - below right.



***In an underwired bra, the underwire casing is sewn to the wire line seam raw edges.***

***This means that the position of the lines of top stitching around the cup will also indicate the position of the underwire casing and the underwire contained within it.***

On the diagrams above, the red area indicates the position of the underwire



casing and the underwire contained within it.

Noted that when an underwired bra is worn, the full width of the underwire casing (when top stitched along both of its edges), sits flat against the chest wall. This has implications for the available cup volume in a bra: consider the case where a certain Y centrepiece bra is being sewn. According to the sewing instructions in the pattern (or, in order to create an identical bra to the pattern bra), its wire line seam raw edges are meant to be turned out of the cup, but instead, they are mistakenly turned into the cup and top stitched to the cup fabric. Making this error will reduce the cup volume by the width of the underwire casing all around the wire line seam, making the cups at least one cup size too small in its fit. In order to maintain the same cup space/volume when converting one style to the other, the length of fabric across the width of the cup, (measuring across the cup fabric from the inside edge of the underwire's central upright to the inside edge of the underwire's side upright) has to remain the same.

Because the full width of the underwire casing and the underwire contained in it, is either completely inside the wire line seam or completely outside the wire line seam, it is either bra body fabric that covers the underwire casing, or it is cup fabric that covers the underwire casing. In the original pattern, the full width of the underwire casing was incorporated into the bra pattern piece(s) that covered the casing.

Converting one of these bra styles into the other, is basically a matter of ***changing the position of the wire line seam, whilst ensuring that the cup volume and the overall fit of the bra remains unchanged.***

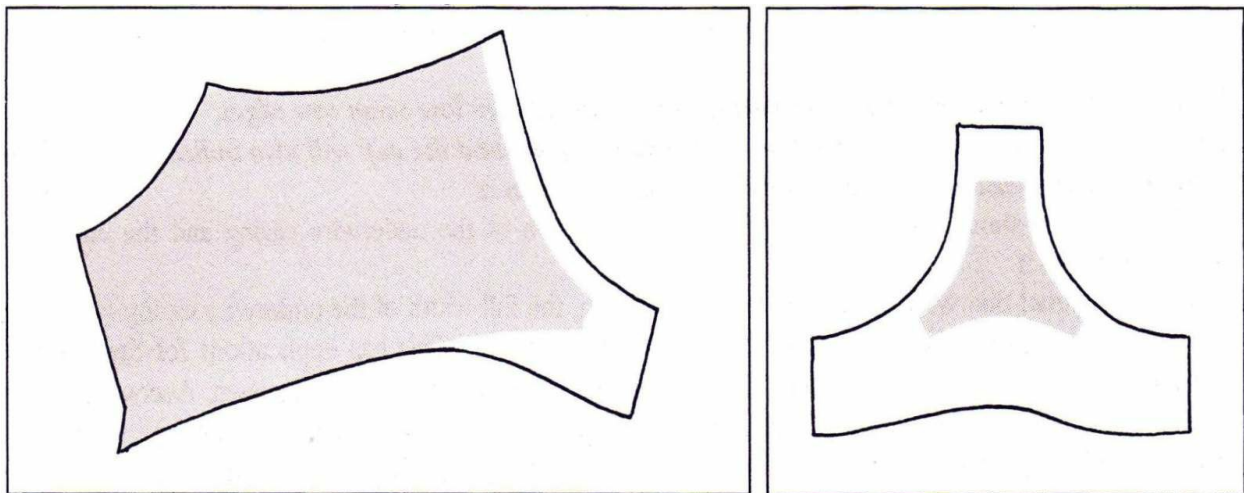
***In summary, the part of the bra that is going to cover the underwire casing after the pattern conversion is made, has to have the width of the underwire casing incorporated into the shape and size of its pattern piece(s), all around the wire line seam.***

***To maintain the overall fit of the bra, the part of the bra that previously covered the underwire casing, has to have the shape and size of its pattern piece(s), reduced by the width of the underwire casing, all around the wire line seam.***

**SO, TO CONVERT A BANDED BRA STYLE INTO A SMALL CENTREPIECE BRA STYLE:** shift the position of the wire line seam from the inside edge of the underwire to the its outside edge:

- Add 1cm to the cup pattern pieces (all around the cup's wire line). The new wire line seam of the cup will be the former cutting line, and the new cutting line around the cup pieces will be 1cm outside the original cutting line.
- Subtract 1cm from the bra body pattern pieces (all around the wire line). The former wire line seam on the bra body will become its new cutting line, and the new wire line seam will be 1cm inside the cutting line on the pattern.

Making the above changes to the pattern pieces will ensure that the fit of the whole bra will not be adversely affected. All that remains to be done, is to re-position the upper and lower edges of the centrepiece, and raise the lower edge of the bra back where it joins to the side of the cup. When lowering the top edge of the centrepiece, and raising the lower edge of the centrepiece, ensure that the position of these finished edges are accordingly marked onto the cup pattern pieces so that when the bra is sewn, the pieces can be correctly aligned. The diagrams below show the way the bra back from a Y centrepiece bra is altered to become the back of a small centrepiece bra and how a Y centrepiece is altered to become a small centrepiece. The red shaded areas show the shape and size of the new pattern pieces. All outside edges of the shapes are the cutting edges.



**TO CONVERT A SMALL CENTREPIECE BRA STYLE INTO A BANDED STYLE:**

shift the position of the wire line seam from the outside edge of the underwire to the inside edge of the underwire:

- **Add 1cm to the bra body pattern pieces** (all around the bra body's wire line). The new wire line seam of the bra body will be the former cutting line, and the new cutting line around the bra body pieces will be 1cm outside the original cutting line.
- **Subtract 1cm from the cup pattern pieces** (all around the wire line). The former wire line seam on the cup will become its new cutting line, and the new wire line seam will be 1cm inside the cutting line on the pattern.

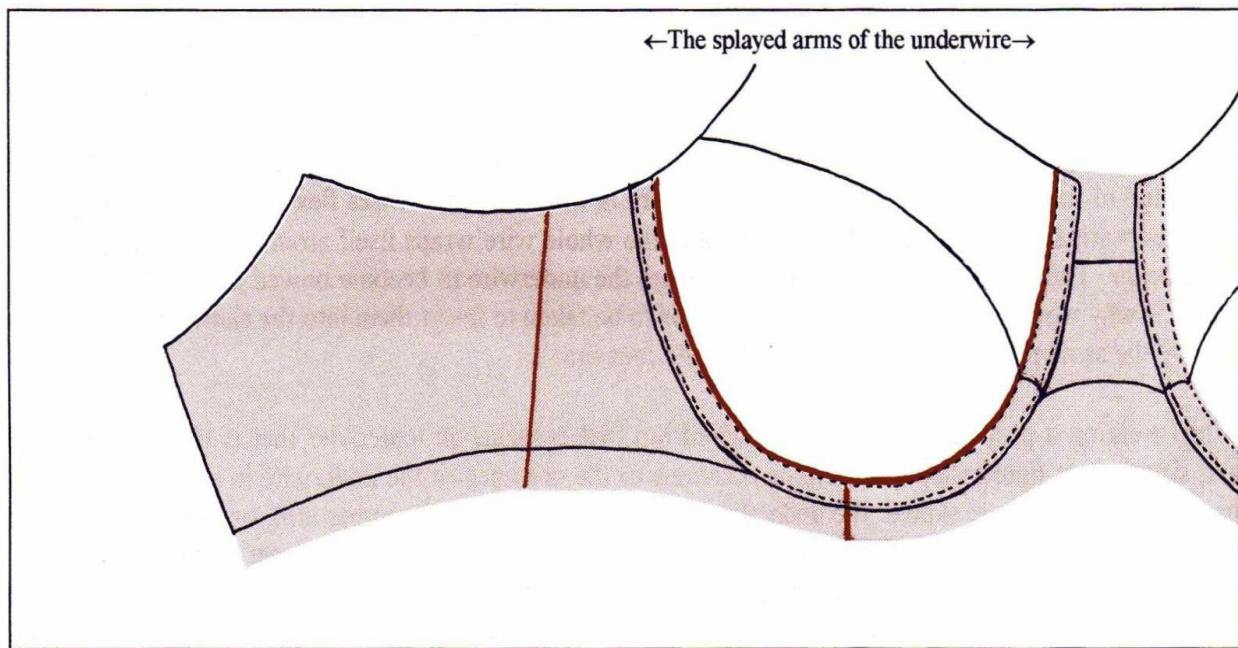
Making the above changes to the pattern pieces will ensure that the fit of the whole bra will not be adversely affected. All that remains to be completed, is to re-draw the upper and lower edges of the centrepiece, and deepen the lower edge of the bra back to produce the band under the cup. Make the top edge of the centrepiece is level with the height of the centre front neckline edge of the cup, (this instruction is only applicable if there was a U shaped space at the centre front in the original bra).

***The inner line of top stitching on the original cup has been replaced by new bra body's wire line seam, so to ascertain the exact shape and length of the new bra body's wire line seam,***

- splay the arms of the right breast cup's underwire apart (the way the underwires are splayed when the bra is worn), and ***trace the inner line of top stitching on the original cup***. If your original cup did not have this inner line of top stitching on it, splay the arms of the right breast cup's underwire apart, and by feel, trace the inner edge of the underwire.

The diagram below shows the original small centrepiece bra (with the splayed right breast cup) and the red shaded area is the new, bra style. The red lines in the diagram show the position of the new seam lines. They are: 1. the new wire line seam, 2. the short vertical seam under the cup that will join the Y centrepiece to the bra back (applicable if the new style of your bra

is a Y centrepiece style), and 3. the side seam (applicable if the new style of your bra is an extended centrepiece style),



If your original small centrepiece bra's back was one complete piece of stretch fabric that extended from the underwire to the closure at the centre back (illustrated on [page 30](#)), it would be best to convert your bra into a Y centrepiece style. This is so that the stretchability of your bra around the ribcage will not be altered. Refer to the pattern drafting information on [pages 13](#), [14](#) and [24](#) and [25](#) in order to draft the new lower edges of the Y centrepiece and back pattern pieces.

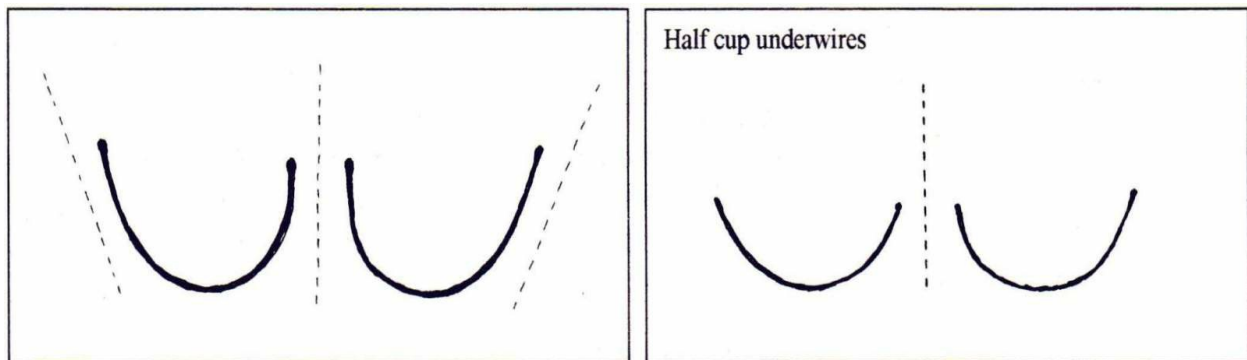
If your original small centrepiece bra's back was in two pieces: a non-stretch side piece seamed to a stretch fabric bra back (illustrated on [page 30](#)), it would be best to extend the existing side seam downwards and convert your bra into an extended centrepiece style. This is so that the stretchability of your bra around the ribcage will not be altered. Refer to [pages 16](#), [17](#) and [29](#) for pattern drafting details.

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## COMPONENTS OF A BRA AND RELATED SEWING TECHNIQUES

## Underwires

Bra underwires are useful in creating a maximum of support with a minimum of material, especially in plunge-neckline romantic bra styles or where the breasts are large and/or heavy. Underwires can be half-cup wires or full-cup wires. Half-cup wires are used for low, plunge-neckline designs and have a very low centre tip. Full-cup wires are higher at the centre front and at the side. Underwires are an asymmetrical 'U' shape (their shape is not the same on each side). The upright that goes to the centre of the bra is generally a little lower and more vertical than the upright at the side. The upright that goes to the side of the bra is generally a little longer (higher), and tends to splay out or 'kick' out toward the armpit. Diagram below left. This is only a generality, and is not the case in every bra.



Most women either love or hate underwires. It is my personal theory that most of the larger women who hate underwired bras have never been fitted correctly for them.

Underwires fulfil a worthwhile function. They give a bra additional structure, increasing breast uplift and support. Bras that do not have underwires are designed to contain structure and provide support without them, obtaining their strength and shaping from their style. To take the underwires out of a bra designed to have them, can be like taking the skeleton out of a human body and expecting the muscles to hold the body upright.

Underwires come in different gauges of wire. Obviously, the lighter and smaller the breasts are, the lighter the gauge of the underwire needs to be. When a bra is worn the underwires flex on the body: the tips of the underwire are splayed apart horizontally and the whole wire wraps itself around the curved shape of our ribcage. The curved form of our ribcage

causes the underwire to become bowed or buckled in shape, which is why when recycling underwires, care has to be taken to insert them into the same breast's cup, in exactly the same position, as they were in the previous bra.

When wearing a properly designed underwired bra that contains an underwire that is the correct shape and size for our figure shape, we will be oblivious to the presence of the underwire in the bra. It will not press into breast tissue, skewer the underarm, catch on the inside of the upper arm, or poke in anywhere. I am convinced that a properly fitting underwired bra does not represent any threat at all to our health. However, I consider some of the underwired bras I have seen to be quite dangerous. The 'worst offenders' are some of the padded push-up bras designed to enhance the appearance of very small sized breasts. These bras have a heavily padded side cup and lower cup, and the padding pushes the breast tissue upwards and inwards, producing a cleavage and an attractive fullness in the upper cup area. Heavily padding the cup in this way is acceptable, but the manufacturers often use the underwire itself in these bras to accentuate the upward and inward push that is exerted on the breast. It is this use of an underwire that I consider dangerous. The types of underwires incorporated into these small cupped, padded push-up types of bras, are some of the thickest, strongest and most inflexible underwires of any that I have seen in any size of bra. They are often shaped so that the side upright curls inwards at the side of the breast, pressing into the side of the breast and pushing the breast inwards. I have seen marks on the sides of breasts where these wires have poked in, and I have heard women telling me how much these types of underwires hurt. It is my conclusion that constant trauma to breast tissue can hardly be safe, especially given the high rates of breast cancer in our society. It is time women were alerted to the danger of wearing ill-fitting and badly designed bras.

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If cutting a steel underwire shorter, use a pair of metal cutters to cut off the excess length, and bevel the sharp points smooth with a steel file or coarse wet & dry paper (i.e. sandpaper for metal). The tip can then be heated up in a gas flame until it is a dull red in colour, let cool for a second, and then



dipped into powdered plastic for one second. The heat still present in the metal wire will melt the plastic onto the tip of the wire. The hotter the wire tip, and the more time the wire tip is in contact with the powder, the more plastic will be melted onto the tip. This powdered plastic when melted is identical to the thick, hard white plastic that coats refrigerator shelving. To purchase powdered plastic, contact your bra haberdashery stockist. Some commercial bra patterns recommend re-tipping an underwire with a 'dab' of enamel paint, but this is a hopelessly inadequate method.

It is advisable to be aware that as with the bra industry as a whole, there are no standards in sizing in bra underwires. In my experience, there seems to be two main types of sizing systems in bra underwires. I have discovered that there is a European sizing system, and an Australian/New Zealand sizing system. The Australian/New Zealand underwire sizes are generous sizes and the European sizes are significantly smaller. Because of the lack of standardisation, it is always safest to match up an underwire shape and completely disregard the size the wire is meant to be. Size is only a very rough, inaccurate guide.

If you require a particular underwire, then it's a simple matter of matching an old wire that's a good fit to either the selection of wires available in a fabric shop or laying it on their wire-charts to see if you can get a good match. Failing that, send your wire or a tracing of it to a bra making haberdashery supplier (faxing the tracing of your wire is an option also). If you haven't got any idea of the size of underwire that you need, obtain some copper wire (medium gauge) from either a hardware shop or an electronics shop, and bend it into a curve that fits nicely into the crease where the breast joins onto the rib cage. Cut it about the right length with pliers and carefully lay in onto a sheet of paper, stick it to the paper with sticky tape at intervals and trace it - producing a tracing that you can send away to be matched.

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## Underwire Casing and Its Application

Underwire casing performs three important functions:

- it contains the underwire in an underwired bra,

- it absorbs perspiration around and under the breast, and
- it conceals the wire line seam raw edges.

There are two main types of underwire casing: ***a furry/felt-surfaced type of underwire casing*** and a ***smooth-surfaced, tightly woven, tape underwire casing***. Most manufactured underwired bras have the felt type of underwire casing in them. This is probably because the felt type contains a greater number of fabric layers and therefore provides more cushioning of the underwire against the body when the bra is worn. There are different qualities of both types of underwire casing. I have seen felt type underwire casing that is so thin and insubstantial that when held up to the light, it was possible to see through it, but on another occasion I was able to buy felt type underwire casing that was wonderfully strong and thick. Both the felt type of casing and the tape casing sit flat against the inside of the bra, being sewn along both the inside and outside edges (producing two lines of stitching on the outside of the garment).

Some small centrepiece manufactured bras have their wire line ***seam raw edges bound with a multi-layered bias binding***. This narrow binding when sewn wrapped around the raw edges produces a cylindrical central channel that not only contains all the trimmed raw edges, but contains the underwire as well. This binding is not sewn flat onto the cup fabric and because of this, when the cup fabric is pulled away from the wire, the wire line seam can swivel around the wire so that it pulls away from the body, exposing the binding. Personally I do not make bras like this, as I find that the binding is such a narrow, uncomfortable, cylindrical strip that both the wire and the binding tends to 'cut in' around the breast, especially underneath the cups.

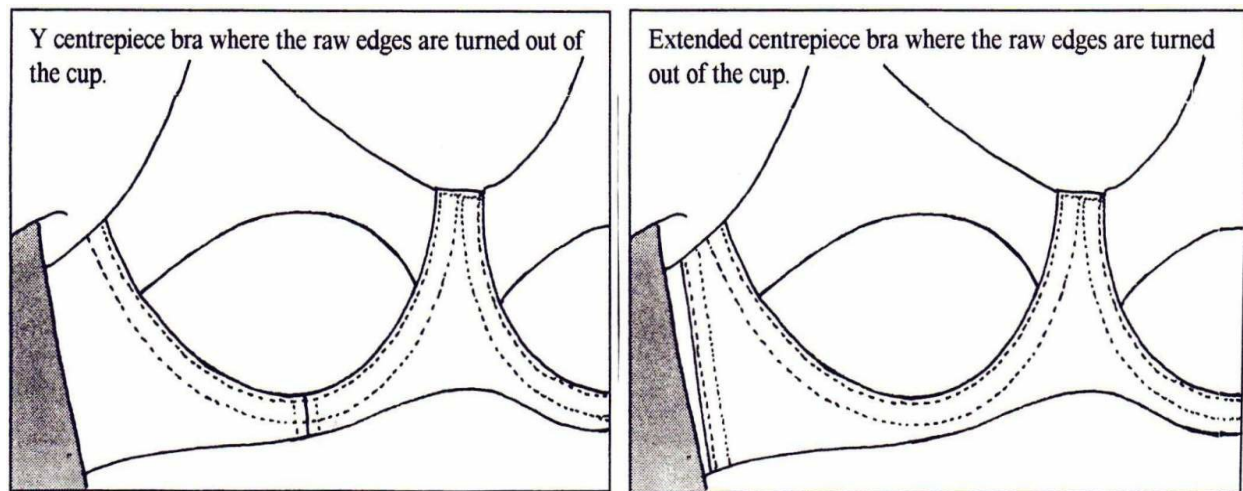
### ***SEWING UNDERWIRE CASING TO YOUR BRA***

The secret to applying underwire casing to a bra in a neat, professional way, is to ***initially stitch the casing to the wire line seam raw edges***. The raw edges (with the casing that is sewn to them) are then either turned out of the cup to be top stitched to the bra body, or turned into the cup to be top stitched to the cup. It is important that the casing is sewn to the correct side of the raw edges so that when they are turned either out of or into the cup

(as your commercial bra pattern or Alternatively your pattern bra will specify), the casing conceals the wire line seam raw edges (and not vice versa). Refer to the information on [pages 75-78](#).

In both a Y centrepiece and an extended centrepiece bra style, as shown in the following two diagrams, the raw edges around each cup space, (with the underwire casing sewn to them), are **turned out of the cup** and top stitched onto the bra body. The two lines of top stitching are **outside the cup**, and are sewn through fabric belonging to the bra body i.e. the raw edges have been turned **out** of the cup.

So that the casing covers up the raw edges in the finished bra, **the casing must be sewn to the cup-side of the raw edges** before the raw edges (and the casing sewn to them), are turned out of the cup to be top stitched.



[page 83]

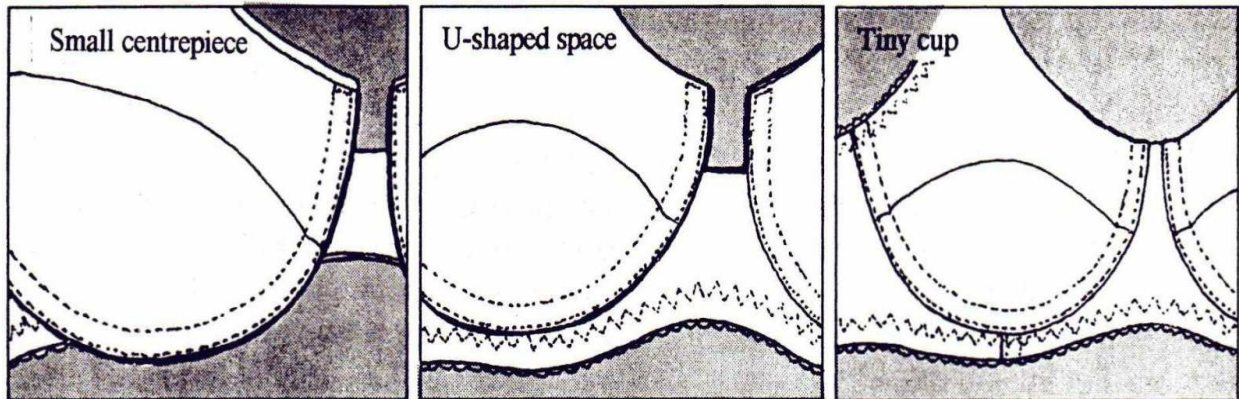
As a general rule, the types of bras where the wire line seam raw edges (and the underwire casing sewn to them), **are turned into the cup** are

- small centrepiece bras,
- bras that have some section of the wire line seam that is exposed (such as those with a U shaped space at their centre front), and
- Y centrepiece and extended centrepiece bras that have very small cup sizes.

In the first two styles, the raw edges around the cup have to be turned into

the cup, in order to be completely concealed in the finished garment. Where the cup size is very small, the wire line seam is a tight little curve, and it is much easier to turn the raw edges into the cup (onto a smaller curve), than to try to turn them out of the cup (onto a much larger curve) to be top stitched.

You will notice that in these three instances, as illustrated in the diagrams below, the two lines of top stitching are ***inside the wire line seam and are sewn through cup fabric***, indicating that the raw edges and the casing sewn to them are turned into the cup. So that the casing covers up the raw edges in the finished bra, ***the casing must be sewn to the bra body-side of the raw edges*** before the raw edges (and the casing sewn to them), are turned into the cup to be top stitched.



When comparing the application of underwire casing where it is turned into the cup as opposed to being turned out of the cup to be top stitched, it is slightly easier if the casing has to be turned into the cup.

This is because when the casing is turned into the cup, ***it is being turned onto a smaller curve***. In this case, care must be taken to ensure that the wire line edge of the cup fabric does not stretch as you are sewing the casing to it, otherwise the length of underwire casing sewn to the raw edges will be too long, and the underwire will seem to be too short for the cup's elongated edge.

It is slightly more difficult to apply the underwire casing where ***the casing has to be turned out of the cup, onto a longer curve***. Because casing does not give or stretch at all, care must be taken to ensure that a long enough length of it is sewn to the raw edges to enable it to be fully turned out of the

cup, and lie flat and neat, against the underside of the bra body.

To enable this to take place, thus producing a tight professional appearance,

- ***the raw edges belonging to the bra body should be nicked*** at close intervals before the casing is sewn to them, and
- ***the raw edges should be slightly stretched as the casing is being sewn to them***, especially from the centre front top edge, under the lowest part of the cup, to three quarters of the way around it, which is where the curve of the wire line seam is the tightest.

***The position of the lines of top stitching indicates not only the direction in which the raw edges have been turned, but they indicate the position of the underwire casing and the underwire contained within it.*** If you remember, the underwire casing is initially sewn to the raw edges before they are turned either out of the cup or into it. The two lines of top stitching seen from the outside of the bra are positioned along the outer edges of the underwire casing, so they indicate from the outside of the garment, the position of the underwire casing, and the underwire within it.

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***It is important to know which way the raw edges are to be turned because this will directly affect the available cup space. The underwire will lie either outside the wire line seam or inside of the wire line seam.***

If your pattern required the raw edges to be turned out of the cup, and they are mistakenly turned into the cup, (with the underwire casing sewn to them), this mistake will produce a cup that is too small. In this case the under-wire will lie inside the wire line seam instead of outside of it, and the cup volume will be decreased by the width of the underwire casing all around its wire line edge. Alternatively, if your pattern required the raw edges to be turned into of the cup, and they are mistakenly turned out of the cup, (with the underwire casing sewn to them), this mistake will produce a cup that is too big. In this case the underwire will lie outside the wire line seam instead of inside of it, and the cup volume will be increased by the width of the underwire casing all around its wire line edge.

Care must be exercised when replicating a bra that has the wire line seam

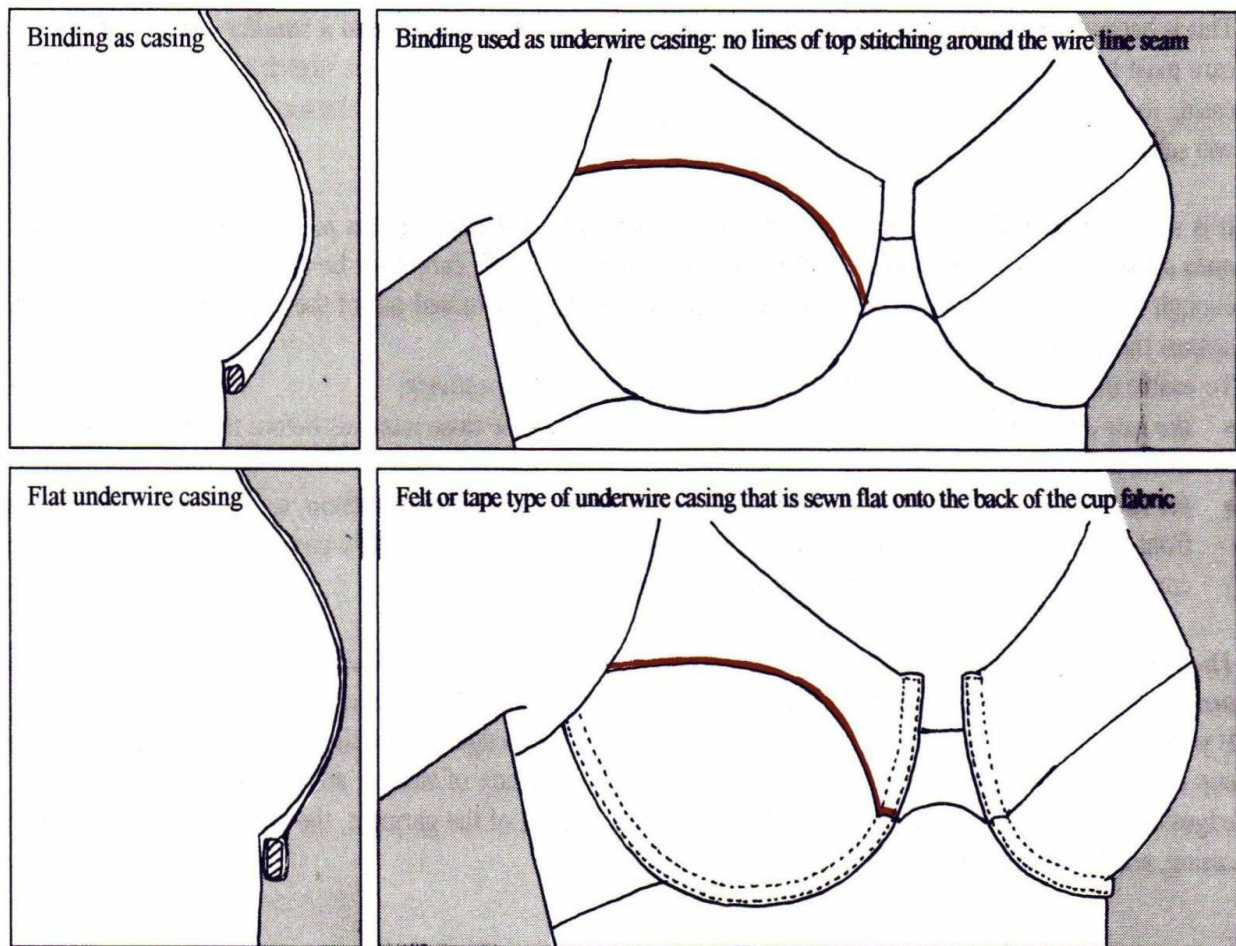
raw edges bound with a multi-layered bias binding, to ensure that the available cup fabric/cup volume remains the same.

***The cup volume is determined by the length of fabric available to lift up off the chest wall and to go up and over the breast.***

Because this narrow binding isn't sewn flat onto the inside surface of the cup, the available cup fabric in this type of cup is measured right from the wire line seam. Where one of the other types of flat underwire casing are used in a small centrepiece bra, they will be sewn flat onto the inside of the cup fabric, so the fabric available for the cup must be measured from the inside of the underwire casing on one side of the cup to the inside of the underwire casing on the opposite side of the cup. The following left diagrams are cross sections of a small centrepiece bra when worn (when viewed from the waist upwards). The bra in the top diagram has its wire line raw edges bound, and the bra in the diagram below has its underwire contained in a flat type of underwire casing that is top stitched flat onto the inside of the cup fabric. The red line indicates the expanse of cup fabric that is able to cover the breast in each bra. For the cup volume to be the same in each bra, the red lines have to be equal in length.

So if you are going to use one of the flat types of casing that will be sewn onto the inside surface of the cup fabric instead of the binding that was used in the original bra, ***add the width of the new flat type of underwire casing to the wire line seam on the original cup pattern pieces.***



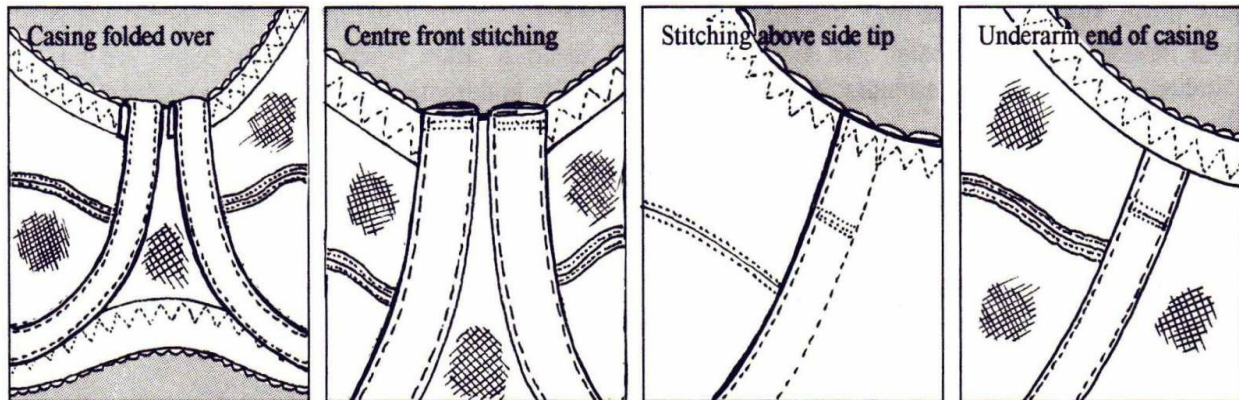


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There are various ways of sewing underwire casing to a bra. Some methods are better than others. In order to seal off the centre front channel in the casing, some sewing instructions recommend that the centre front end of the casing be folded over onto itself before it is sewn to the bra. Diagram below left. I find that this method produces unnecessary needle-breaking bulk, and is therefore only possible to accomplish if the casing itself is very thin and poor quality.

I prefer to seal off the centre front channel of the casing with two lines of tiny straight stitches sewn back and forth a few times across the width of the casing. Sewing two lines of stitching, one line a little higher than the other is a much neater, more manageable technique. Centre diagram. These lines of stitching will be concealed under the bow that is sewn to the centre front of the bra. If additional insurance against the wire tip penetrating the stitching

is desired, a drop or two of washable fabric/craft glue can be squeezed down into the centre front channel of the casing before sewing across the casing to seal off the channel. The tiny straight stitches combine with the glue to produce extra strength. These new types of washable glue form clear, flexible, permanent bonds that will stand repeated washing.



Whichever method you use to sew casing to a bra, it is important that the underwire be prevented from sliding from side to side inside its length of casing. Excess movement of the underwire rubs the casing thin, thus increasing the risk of wire tip penetration. To hold the underwire stationary inside the casing, once the wire has been inserted into the casing, I always seal off the central channel of the casing just above the side/underarm tip of the underwire. To do this use a line of very tiny straight stitches sewn back and forth a few times across the width of the casing, and a zipper foot on your sewing machine (so that the line of stitches can be positioned as closely as possible to the wire tip). Diagram above right.

To prevent having to turn the casing over when the underarm edge is finished off with narrow scalloped elastic, only sew the casing to the bra up to the point where it is 1cm lower than the raw fabric underarm edge. Leaving this 1cm space under the raw underarm edge will allow the elastic to neatly turn over the end of the casing, avoiding needle-breaking bulk.

In order to prolong garment life, it is important to select strong underwire casing, especially if the bra size and/or cup size is large. If a heavy quality of casing is not available, I normally sew a double layer of underwire casing to the bra, taking advantage of both the strength of the tape casing and the cushioning nature of the felt type casing. The technique for double casing is

found on [page 128](#). When sewing both types of casing to a bra, the tightly woven tape casing is sewn onto the wire line seam's raw edges, and then felt underwire casing is sewn over the tape casing. Both layers of casing are then treated as one: the raw edges are trimmed back, and the casing is top stitched down. When the underwire is inserted, it is inserted into the central channel of the tape casing, so that one layer of tape, as well as all the layers of the felt type casing will be between the wire and the body when the bra is worn. This technique increases garment body, provides additional cushioning of the wire against the body, and considerably reduces the chance of wire tip penetration occurring.

When making non-underwired bras, I often sew underwire casing around the inside edges of the cups, as the casing covers up the raw edges, absorbs perspiration, and gives the bra more garment body.

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## Cup Fabric

***Cup fabric in manufactured bras is mostly a knit fabric and/or lace.*** Knit fabrics and most laces have the ability to conform to the smooth, curved surface of the breasts. The multi directional 'give' in a knit fabric allows it to mould itself beautifully over the surface of the breast without puckering, pulling, or creasing. Lightweight knit fabrics can be perfect for bra cups: they are strong, non-bulky, supple, and because they don't fray, the raw edges can be trimmed back 'hard' without weakening the seam line stitching.

To obtain strength without adding bulk is very important in bra making. A bra is such a tightly constructed garment, with a number of small pieces of fabric sewn to each other within a small area that every opportunity must be made to minimise excess seam line bulk. After each seam of a bra is sewn, the raw edges of that seam are generally top stitched flat onto the inside of the garment (using top stitching positioned fairly close to the seam line), and then any excess raw edges are trimmed back 'hard' to the line of top stitching. In this way, the seam line bulk is not allowed to build up to a degree that will break your sewing machine needle. The wire line seam is the only seam where the raw edges are not top stitched and immediately trimmed back. This is because the underwire casing has to be sewn to the

wire line seam raw edges.

The reason why woven fabrics are not extensively used in manufactured bra cups is that a woven fabric can tear, fray, pucker and pull tightly across sections of the cup surface.

***A bra cup relies on every ounce of give or stretch in its fabric to accommodate the shape and size of a breast.*** Both the direction and degree of the stretch or give contained in the cup fabric is therefore of critical importance to the success of your bra making.

- ***The amount of give or stretch contained in the cup fabric will determine cup volume/size, and***
- ***the direction in which the greatest amount of stretch or give runs in the cup pieces will determine the shape of the cup when the bra is worn.***

***The most important characteristic of any bra cup fabric is its stretchability*** i.e. the extent of its ability to give or stretch.

***The term 'give.'*** Many bra cup fabrics contain a certain amount of 'give' simply because the structure of the fabric is a knit. When pulled, the knit fabric expands just the way that a knitted woollen jumper will. When let go, the knit fabric goes limp, and slowly regains its original shape.

***The term 'stretch'.*** Some bra cup fabrics contain 'stretch.' Stretch is the result of synthetic rubber being knitted into the fabric. When pulled, the fabric expands and when let go, the fabric bounces back to its original shape, in much the same way as will a stretched rubber band. It is this 'bounce-back' factor that indicates stretch.

Cup fabric can vary from being very rigid/non-stretch bonded lace to a 'spongy' nylon or cotton lycra containing multi-directional stretch.

***Every bra cup pattern is fabric specific*** i.e. each bra cup pattern is meant to be used with a particular type of fabric or lace. Should you be making a bra using a commercially available bra pattern, the type of cup fabric required should be specified, and arrows on the pattern pieces will indicate the direction of greatest stretch within the fabric. Only when the cup pattern is used in conjunction with the correct type of cup fabric, will the cup volume and cup shape be as the designers of the pattern intended them to be. If you

intend to buy a bra-making kit make sure that the cup fabric in the kit is the type that your pattern or your bra requires. Don't be afraid to specify the type of fabric or lace that you require when buying or ordering a bra kit. Alternatively if you are cloning a successful manufactured bra use cup fabric identical to the original cup fabric in your pattern bra. When drafting the cup pattern, use large arrows to indicate the direction of greatest give/stretch, and when cutting out the cup pieces ensure that the alignment of the direction of greatest give/stretch in your new bra cups is an exact copy of this alignment in your pattern bra.

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If an identical fabric or lace is unavailable, use a fabric or a lace that contains identical stretch properties. If you are unfamiliar with the cup fabric in your pattern bra, you may be able send your bra to a bra-haberdashery supplier so that the particular fabric can be identified. Once you know what kind of fabric is required for your bra cups, you can then order more of this fabric for your new bras. Be aware that some bra haberdashery suppliers will only sell cup fabric as part of a complete bra kit. Even if they will not sell bra fabric by the metre, they may sell you the fabric you require by the piece. As bra making becomes more common, bra making fabrics will become more readily available. A familiarity with these basic bra cup fabrics is wonderful to have and some bra haberdashery suppliers sell packets of fabric samples.

Here is a description of some of the common cup fabrics used in manufactured bras.

**BONDED LACE** - This is usually a non-stretch lace bonded to a 'lining' layer of rigid stabiliser. Rigid stabiliser is the tightly knitted, semi-transparent, non-stretch nylon knit that manufacturers use for the inner pockets of men's trousers. ***A bonded lace of this kind is predominantly non-stretch, but often contains a very slight one-way give.*** The bonding that joins the under surface of the lace to the stabiliser is an extremely thin film of melted plastic and is consequently a very weak join. It is generally only strong enough to hold the two layers of fabric together until the bra is constructed and worn once or twice. The reason why the two layers are bonded together is so that

they can be treated as one in both the cutting out and sewing stages of garment assembly. This serves to make the manufacturing process as efficient as possible. Usually a few launderings is enough to separate the two layers, but by then the bonding has fulfilled its primary function. Because they have the same stretchability, this kind of bonded lace can be substituted for bonded tricot.

- ***If making your own bonded lace, the quickest and easiest to bond a sizeable piece of lace to a same-sized piece of rigid stabiliser using extremely fine fusible webbing.*** Fusible webbing is commonly used in applique work. A layer of fusible webbing is placed between the two layers of fabric that are to be bonded together, and then the three layers are ironed together with a medium steam iron. When ironed, the ultra-fine layer of webbing melts, fusing the two layers on either side of it together. When purchasing fusible webbing, choose the lightest and finest fusible webbing available. If the webbing is too thick, the thicker layer of melted plastic can make the bonded lace too stiff and inflexible, reducing its ability to mould itself to the curved surface of the breast.
- If extremely fine fusible webbing is not available, then another way to bond the lace to its lining layer is to ***edge-fuse the two layers together, one cup piece at a time using strips of fusible webbing*** that is available. To do this, cut the lace and stabiliser cup pieces out separately, and using narrow 1cm (½ inch) wide strips of fusible webbing, edge-fuse each lace cup piece to its stabiliser lining piece, positioning the strips around the outside of each cup section (approximately within the seam allowance). Doing this will allow the lace and the stabiliser layers to be treated as one when the bra is being sewn whilst allowing the central area of each cup piece to remain supple.
- Alternatively, the lace and stabiliser cup pieces can be cut out separately, ***and each lace cup piece can be basted, tacked or stay stitched to its stabiliser lining piece.*** If stay stitching the two layers together, it is advisable to use a walking foot on your sewing machine to feed both layers through the machine at the same rate. This prevents the slippage between the two layers that can cause of



puckering.

**BONDED TRICOT** - This is usually double-knit tricot bonded to a 'lining' layer of rigid stabiliser. A bonded tricot is predominantly non-stretch but often contains a very slight one-way give. Because they have the same stretchability, this kind of bonded tricot can be substituted for bonded lace. If making your own bonded tricot, follow the above instructions that apply to making your own bonded lace.

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**SINGLE-KNIT NYLON TRICOT** - or lingerie jersey. This is a fine, light weight, knitted nylon that is often coated with a substance that reduces its tendency to accumulate static electricity. It is commonly used in the manufacture of lingerie: petticoats, French knickers, camisoles, and nighties etc. It contains **excellent give in one direction** and almost no give whatsoever in the opposite direction.

**DOUBLE-KNIT NYLON TRICOT** - This is a very similar fabric to single-knit nylon tricot, but it is thicker and being a double-knit, its cut edges will not curl like the cut edges of single-knit tricot. It contains **moderate give in one direction**, and almost no give whatsoever in the opposite direction.

**NON-STRETCH LACE** - Laces can be bought as lace fabric (by the metre) or as self-edged strip lace. **The density of a lace is important** as it determines how much 'movement' is possible in the lace (how much the lace can expand to accommodate the size of the breast). Some laces are very open in their structure (often having a net-like base), and other laces are very rigid, being 'tight' or heavily embroidered. Take note of the type of lace in your pattern bra, and use a lace of the similar density in order to produce exactly the same cup volume. I am sometimes surprised by how much cup volume is produced by the openness of a lace, especially when the lace sections on a cup have no fabric behind them. Unlined lace sections on a cup can irritate sensitive breast skin, so if you are cloning a cup that has unlined lace sections, you may wish to replace these lace sections with lace-over-fabric or just fabric. If making this substitution, be aware that you may have to add a little more volume to the cup pattern to compensate for the slight loss in cup volume. Refer to [page 54](#).

Some laces are embroidered sheer tricot lining, and can contain significant one-way give, depending on how heavily the base fabric has been embroidered. As a general rule, the heavier the embroidery, the less movement in the lace. If the cup lace in your pattern bra is an embroidered sheer nylon knit, then to produce an identical cup volume, an embroidered knit lace should be used when sewing your new bras. If an embroidered nylon knit lace is not available, embroidered: single-knit tricot, single-knit cotton or poly/cotton interlock are all alternatives that may be tried. Many computerised sewing machines can create beautiful embroidery, so this would be an opportunity to explore the possibilities.

***STRETCH LACE*** - or lycra lace. Stretch lace can be bought as lace fabric (by the metre) or as self- edged strip lace. Stretch laces have a predominant one-way stretch (that in strip lace usually runs parallel to the self-edge). The amount of stretch contained in a lace can vary. A cotton/elastane lace will produce a stretch lace that is fairly firm, containing low to medium stretch, whereas a nylon/elastane lace can produce a stretch lace that is soft and spongy, containing high stretch.

***SHEER TRICOT LINING*** - As its name suggests, this fabric is an extremely fine, almost transparent nylon knit that is mostly used as a lining fabric, especially underneath stretch lace.

***It contains moderate give in one direction and excellent give in the other direction.***

***COTTON LYCRA*** - This is a cotton/elastane knit containing ***medium two-way stretch***. The better quality cotton lycras contain a higher percentage of elastane, and therefore have better multi directional stretch. Cotton lycras will shrink significantly when washed, making it vital to pre-shrink your fabric prior to garment construction. If there is cotton lycra in the cups of your pattern bra, it is advisable to use the same quality cotton lycra in the cups of the new bras that you make.

***NYLON LYCRA*** - This is a nylon/elastane knit containing ***high two-way stretch***. The better quality nylon lycras contain a higher percentage of elastane, and therefore have better multi directional stretch.

***MIRROR SATIN LYCRA*** - This is a type of nylon lycra and is sometimes called

stretch satin. It contains **high one-way stretch** (an excellent stretch in one direction, but no stretch at all in the opposite direction). As its name suggests, the surface of this fabric has a very beautiful mirror-like sheen. It comes in various weights/qualities, and is an expensive fabric.

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## Sewing Cup Seams

***When sewing a bra, it is very important to sew with consistent, accurate seam allowances especially in and around the cup where the fit is critical.***

Taking cup seam allowances that are bigger than the pattern allows for, will produce bra cups which are far too small. Similarly taking cup seam allowances that are smaller than the pattern allows for will produce bra cups that are far too big. Because a bra is such an exact-fitting garment, bra making is an exercise in precision sewing. When a bra is sewn, the exact width of the seam allowance built into the pattern should be the exact distance between the raw edges of the fabric and the stitching line.

One of the advantages in drafting your own bra pattern is that you can make the seam allowances as wide as you are used to sewing with. I always use a 1cm wide general seam allowance in a bra pattern because both narrow scalloped elastic and underwire casing are 1cm wide. Using a 1cm wide general seam allowance makes it easier to sew both narrow scalloped elastic and underwire casing to a bra.

If you are not familiar with sewing with the particular seam allowance that is built into your bra pattern, it is a good idea to use the markings on the sole plate of your sewing machine to help you maintain accuracy. To determine which mark to use, place a cup pattern piece under the presser foot of your sewing machine and lower your needle into the stitching line. Lower the presser foot and note where the raw edge of the pattern is in relation to the seam allowance markings on the sole plate of your sewing machine. When sewing your seams, run the raw edges along this line with your needle position in the centre.

***When sewing bra cup seams it is best to use a type of stitch that is compatible with the amount of stretch or give contained in the cup fabric.***

- ***If your cup fabric is rigid*** e.g. a predominantly non-stretch bonded

lace or a bonded tricot, ***use a short straight stitch*** to sew your cup seams.

- ***If your cup fabric contains a small to medium amount of give, then a small straight stitch can still be used, but slightly loosen the upper thread tension*** so that the seam line and the top stitching will not pull tightly across the breast when the bra is worn. Loosening the thread tension like this will allow you to sew the mid cup seam(s) using a straight stitch, which means that the raw edges of the seam can be parted and top stitched apart, again using a straight stitch with a loosened thread tension.
- ***If your cup fabric contains significant stretch or give, then a tiny zig zag should be used to sew the cup seams.*** If your cup seam(s) have to be sewn with a tiny zig zag, because of excessive stretch or give within the cup fabric, the raw edges cannot be parted because of the form of the stitch. In this case, the raw edges are not top stitched, they are just trimmed back near to the stitching line. Again, slightly loosening the upper thread tension is a good idea if even more flexibility is required in the zig zag seam line.

If the seam line stitching pulls tightly across the surface of the breast when the bra is worn it will produce unsightly bulging of the breast on either side of the seam line, and there is a danger of the tight stitching breaking and the seam consequently splitting. Cup seams should be strong yet flexible: the stitches should be closely spaced using a small stitch length, yet their tension should allow the stitches to slightly expand under pressure. As you can appreciate, tight seam lines not only compromise the professional appearance of our bras, but the strength of the garment.

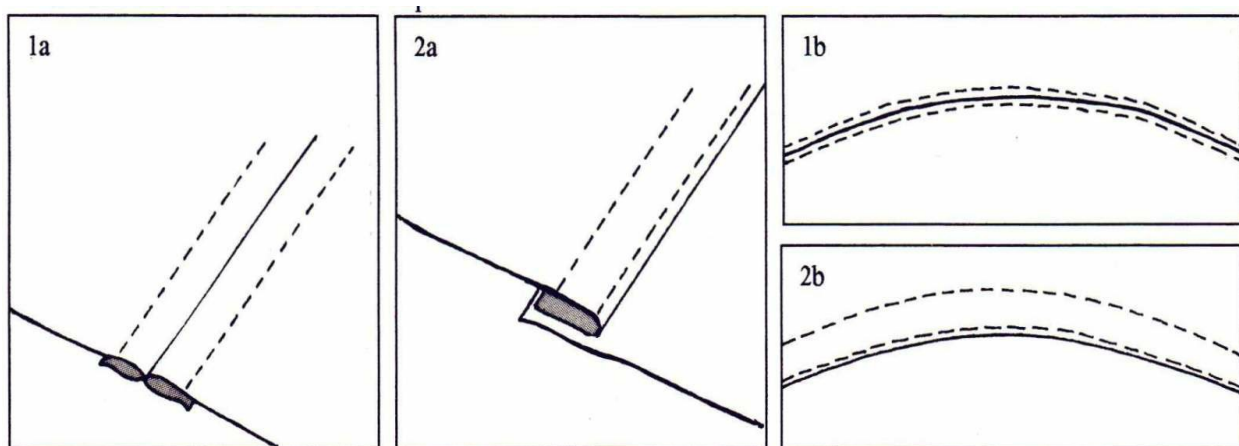
Always get a small sample of cup fabric to test the type of stitch and the tension that you plan to use for the cup seams. Sew a test seam and pull the seam along the line of sewing to gauge how much 'movement' is in the seam, checking that the stitching is not going to pull tightly or break. There is a different amount of pressure exerted on different types of cup seams e.g. the seams in a padded bra cup in one of the smaller sizes will not experience the pressure applied on a cup seam in a much larger cupped bra.

If you are cloning a manufactured bra, stretch the cup seams to determine how much 'movement' is in the seams and let this be your guide.

There are many ways of finishing cup seams however the two most common methods are illustrated below.

The first type of seam is where the seam is sewn using a small straight stitch, and the two raw edges are parted, (one to either side of the seam line), and top stitched close to the seam line. The raw edges are trimmed back 'hard' to the lines of top stitching.

- This method of finishing a seam has the advantage of minimising seam line bulk, and is a very useful technique if your cup fabric or lace is quite strong and thick Diagram 1a. This is the type of seam that should be sewn if the fabric or lace on either side of the seam line is of equal thickness, and you want to make the seam line unnoticeable under clothing. Where the raw edges are parted like this, their bulk is evenly distributed onto either side of the seam line, and there is little chance of the seam line forming a noticeable ridge across the cup. Diagram 1b shows this type of seam from the outside of the cup.



Another common way of finishing a seam is to **turn all the raw edges to one side of the seam.**

This technique should not be used if your cup fabric or lace is quite thick, as three thicknesses of fabric or lace end up being on one side of the seam line.

Using this second technique:

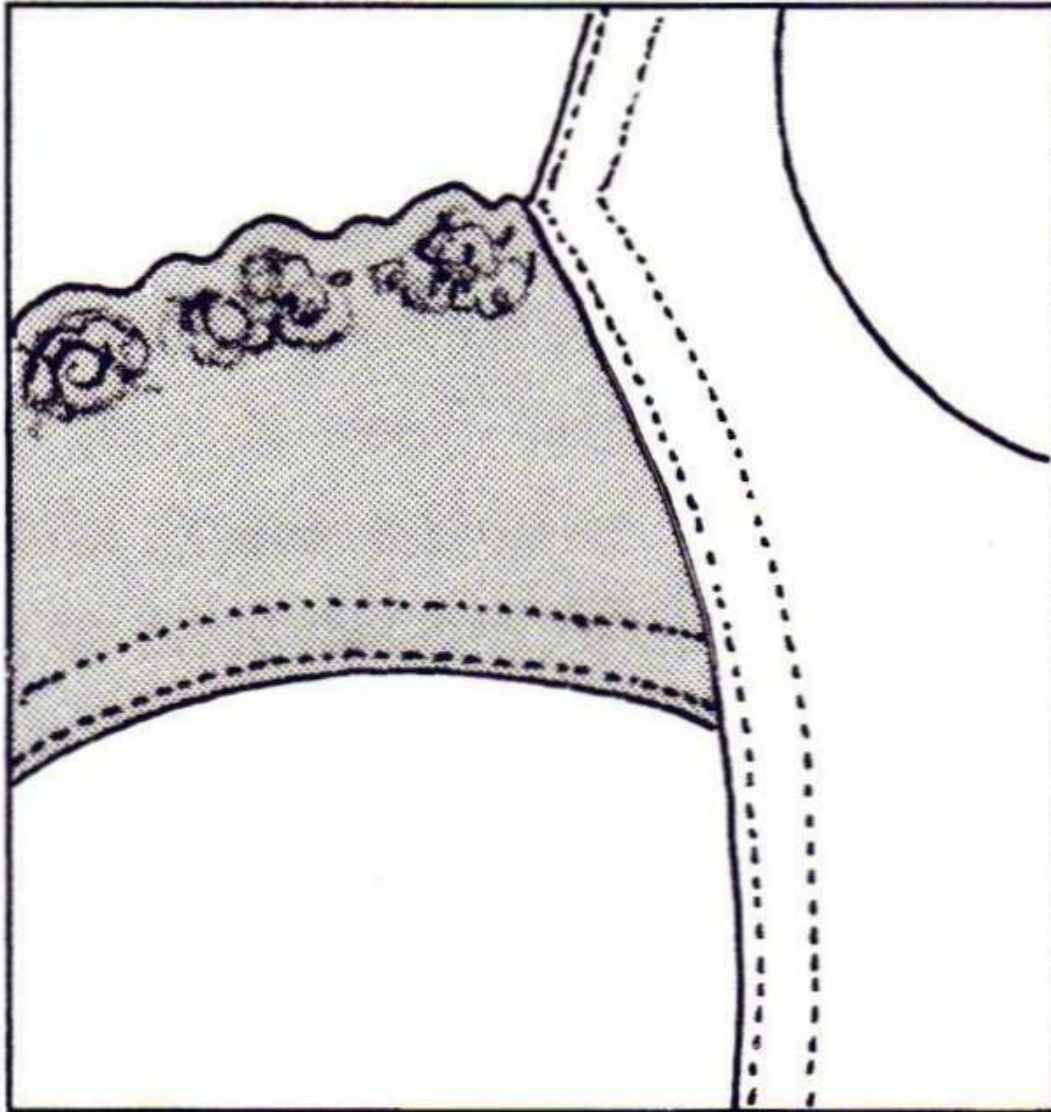
- adds extra strength to a seam, and
- evens out the thicknesses on either side of the seam line where a thicker fabric is sewn to a finer fabric or lace. In this situation, the raw edge that is made of thicker fabric does not have to turn back onto itself, and all the raw edges are turned towards the cup part made of finer fabric or lace.

It is the raw edge composed of the finer fabric or lace that is trimmed back fairly close to the seam line. This trimmed raw edge will end up being the enclosed raw edge. Both raw edges are then turned toward the part of the cup that is made of the finer fabric. Diagram 2a. The raw edges are then pin stitched and top stitched, and any remaining raw edge composed of the thicker fabric is trimmed back 'hard' to the line of top stitching. Note: pin-stitching is top stitching that is positioned a pin width away from the seam line. Pin-stitching is useful for 'flattening' the seam line and producing a tight professional finish to a garment. Diagram 2b shows this type of seam from the outside of the cup.

If you are seaming together two cup parts made of very fine delicate lace or fabric, this second seaming method is my preferred choice, as it produces a stronger seam line. In the first technique, only the stitching thread holds the two cup parts together. In the second technique, stitching that penetrates three layers of lace or fabric is holding the two cup pieces together.

This second technique is also used where a side cup piece is joined to an inner cup piece that has a finished neckline edge. In this case, the raw edge belonging to the side cup piece is trimmed away along that part of the seam that joins the two cup pieces, all the raw edges are turned towards the side, and are pin stitched and top stitched. Diagram below. The pin-stitching and top stitching of the seam when continued upwards, becomes the hem of the side cup piece's neckline edge.





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### Covering the Raw Edges on the Inside of a Bra

It is important that all the raw edges on the inside of a bra be non-abrasive. The raw edges along side seams, and around and under the cup in a non-underwired bra, can all be concealed using ***felt-surfaced underwire casing*** (edge stitched in position).

It is especially important that the raw edges on the inside of a bra cup be non-abrasive. Breast skin is very tender, and easily irritated by synthetic fibres and the cut edges of synthetic fabric and laces. Laces in particular can be very problematic in this aspect. The stretch laces can be very soft and non-abrasive, but some of the stronger non-stretch laces can be quite harsh

next to skin. Because we want the cup surface to be as smooth as possible, and the cup seams to be as unnoticeable as possible, using underwire casing to cover the raw edges produced by the cup seams is not a viable option. The first way to ensure that the inside of a bra cup is 'skin friendly,' is to selectively employ a method of top stitching the raw edges produced by the cup seams. The second way is to edge-stitch a narrow tape over the problematic raw edges.

### ***Using top stitching wisely***

If one section of the bra cup you are making has a surface that is more likely to irritate the breast surface than the rest of the cup (e.g. a lace upper cup with a smooth-surfaced tricot lower cup), it is a sensible practice to ***turn both raw edges towards one side of the seam line (toward the section of the cup comprised of abrasive fabric/lace)***. The smoother raw edge will be turned over, and will cover up a trimmed-back abrasive raw edge, and the edges are pin stitched and top stitched. Pin-stitching is top stitching positioned very close to the seam line. Finishing the seam in this way, fully encloses the abrasive raw edge along the seam line that joins these two types of fabric together, thus preventing the abrasive raw edge from rubbing against the surface of the breast when the bra is worn. If the whole cup is made out of a synthetic bonded lace whose raw edges have the potential to irritate the surface of the breasts, employing this same technique is still a useful option. In this case, when both raw edges are turned to one side of the seam line, it is the smoother-surfaced base fabric that the lace is bonded to, that will be against the skin, rather than the problematic patterned surface of the lace.

### ***Covering the raw edges on the inside of the cup***

There are instances where selective top stitching cannot be used to prevent breast irritation, and the raw edges must be parted and covered with a very narrow strip of fabric. Bra manufacturers commonly use sheer tricot strip over the raw edges on the inside of bra cups, however I have talked to many women who have found that this sheer tricot strip is itself the cause of irritation to their breast skin. Not only is this a problem, but as a home sewer we only have a domestic sewing machine with which to sew it to our

bras. It is very difficult to fold the narrow, insubstantial, lightweight strip into three and then edge stitching it to our garment. (Bra manufacturers have a specialised machine that applies this sheer strip). The only advantage of this sheer tricot strip is the fact that it doesn't add unnecessary bulk to the cup seam lines, allowing the cup seam lines to be as pliable and as unnoticeable as possible. However there are alternatives to using sheer tricot strip to cover raw edges, and if applied carefully, using good sewing techniques, cup seam lines will still be pliable and unnoticeable under clothing. The following are situations where the raw edges of cup seams must be parted, one to each side of the seam line. In these cases, a substitute for sheer tricot strip must be used.

If the whole cup is made out of an ***unlined synthetic lace*** whose raw edges have the potential to irritate the surface of the breasts, no matter in which direction the raw edges are turned, there will still be a raw cut lace edge exposed, and so this must be covered.

Another instance where the raw edges must be covered, is ***when the whole cup is made of a substantial bonded lace*** that is quite thick. In this case, the raw edges should be parted, one to either side of the seam, in order to minimise the bulk and prominence of the seam line.

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### ***Alternatives to edge stitching sheer tricot strip over the cup seam's raw edges.***

Once the cup seams are completed, the raw edges top stitched apart (very close to the seam line), and the seam's raw edges are trimmed back (hard) to the lines of top stitching, one of the following alternatives can be selected and used.

1. ***Edge stitch trimmed poly/cotton bias binding over the raw edges.***

Trim one of the side edges from narrow, poly/cotton bias binding, fold it lengthways into three, folding the new cut edge under, and then to edge-stitch it over the raw edges. If trimming back the width of the bias binding like this produces too narrow a strip for the raw edges then in future, position your top stitching much closer to the seam line, and trim the raw edges back a lot harder (refer to [page](#)

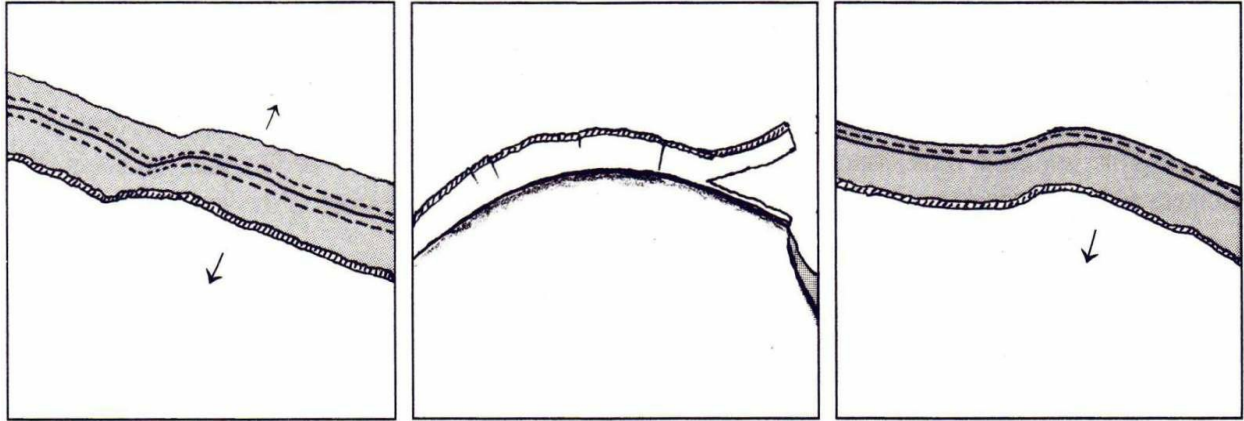
[93](#)). When the lines of top stitching are positioned very close to the cup seam lines, a tight, professional finish to the cup is produced. I realise that this takes experience as well as confidence to achieve, but this is what you are aiming for.

2. ***Edge stitch pre-shrunk 6mm wide woven cotton tape over the raw edges.*** This type of cotton tape is commonly sewn into the shoulder seams of T-shirts and sweaters. Because it shrinks so much, this tape must be thoroughly pre-shrunk before it is used. Being a woven tape, and not being cut on the bias, it has the disadvantage in that it is very rigid, which restricts its use to cups that are made of rigid cup fabric.
3. ***Edge stitch a strip of poly/cotton interlock over the raw edges.*** Cut the strip out with its non-give direction going along the length of the strip. This knit strip can be ***folded into three lengthways***, and edge stitched just like the original sheer tricot strip. Alternatively, in order to avoid excess bulk and to make stitching it to the cup a little easier, it can be a ***flat, unfolded strip*** whose cut width is its finished width (approximately the same finished width as the folded sheer strip). As a knitted fabric, the strip won't fray along its cut edges, and being such a soft fabric, the cut edges won't irritate the breast skin. If sewing a flat interlock strip to the cup, I suggest that you:
  - cut the strip approximately 3 or 4 times wider than the finished width,
  - place it approximately in its finished position against the back of the fabric (inserting the pins that hold it in position from the right side of the fabric), and
  - sew the two lines of stitching from the right side of the cup. Note: because you are sewing from the right side of the fabric, these two lines of stitching can be positioned directly over the top stitching already on the cup, creating a neater finish.
  - Trim the edges of the interlock back so that they are level with the trimmed raw edges of the seam.

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As there is considerable trimming back of raw fabric edges to reduce seam line bulk in bra making, a small, strong, sharp pair of fabric trimming scissors is invaluable. Scissors that are 'tailor-made' for bra making are 'duck-bill' / applique scissors. Their accuracy and maneuverability is unsurpassed. They are specifically designed so that raw fabric edges underneath lace can be safely trimmed back, making them perfect for insertion lace in heirloom sewing, lingerie sewing and bra making. The smooth rounded edge is designed to hold the lace or cup fabric away from the cutting area, preventing it from being accidentally snagged and nicked. When trimming back the raw edges formed from a seam that has the raw edges top stitched apart, I teach my students to observe the following steps. When these steps are followed, the raw edges can be trimmed back extremely hard without danger of accidentally cutting a hole in the bra.

- There are two raw edges formed by the seam: one coming towards you and one edge going away from you when the garment is held wrong side up in front of you. Diagram below left.
- ***It is the raw edge that is coming toward you that will be trimmed back first.***
- ***Pinch this raw edge upward between the thumb and forefinger*** of the hand that will not be using the scissors.
- ***Turn everything else hard downwards.*** The only piece of fabric turned upwards should be the raw edge that you will be cutting back. Centre diagram. At the front of your work, all you can see is the underside of the raw edge that you will be trimming back and the folded-down fabric that is not to be cut. Diagram below right.
- Cut the raw edge back. You can't accidentally cut anything behind the raw edge, because the other raw edge and all the other fabric is folded down hard, out of the way. You can clearly see the folded fabric at the front of your work, making it easy to trim the raw edge back safely.
- ***Turn your work around 180 degrees*** so that the raw edge that was previously going away from you, is now coming toward you, pinch it up and fold everything else downwards. Trim this other raw edge back.



## The Correct Needles for the Task

**Most of a bra should be sewn using a medium size stretch needle** on your sewing machine. A stretch needle is a **teflon-coated ball-point needle**. The teflon coating on the needle helps the needle to penetrate elastic and elasticised knit fabrics, making it the obvious choice for bra making.

If a normal ball point needle is used instead of a stretch needle, skipped stitches may occur. Skipped stitches are a sign of an inadequate needle: either a blunt needle, a bent needle or the wrong type of needle for the type of fabric being sewn. I find that a new stretch needle only lasts for one or two bras, and then it has to be replaced. The elastics in bras tend to blunt needles very quickly.

**The only part of a bra that should be sewn with a sharp/universal needle, is the underwire casing.** When sewing underwire casing to a bra, and top stitching it flat onto the underside of the bra, quite a few thicknesses are being sewn at once, making a sharp needle for this part of a bra's construction, a necessity.

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## Centrepiece and Bra Back Fabric

**A fine, but strong fabric is required for the centrepiece.** The centrepiece in an underwired bra is nearly always non-stretch in the horizontal direction. This is so that the cups will not stretch apart when the bra is worn. This is the one part of a bra that can be made of woven fabric, however **I recommend that a fine knit fabric or a lace that is bonded to rigid stabiliser be used for the centrepiece.** Knit fabrics contain strength without bulk, and as they don't fray, they are safer to use. If you wish to use bonded lace for



the centrepiece, the lace can be a stretch or a non-stretch lace (because the rigid stabiliser underneath the lace is non-stretch, any give or stretch in the lace will be cancelled out).

There are many different designs in non-underwired bras, and some styles don't have a centrepiece as such ... they have a centre front seam that joins one cup directly to the other cup. Where a powernet or spandex neckline edge piece extends down the centre front in between the cups, it is often reinforced with a rigid stabiliser lining piece in between the cups so that the cups don't stretch apart when the bra is worn.

### **BRA BACK FABRIC**

[Pages 20-32](#) explore the design and structure of the bra back.

***The greatest stretch in the bra back fabric must always go around the body.***

If you make the bra back out of powernet, be aware that when powernet is stretched, it forms rectangular shapes in the fine knit when stretched in one direction and it forms 'circular' shapes in the fine knit when stretched in the opposite direction. The direction of greatest stretch is the direction that produces the 'rectangles'.

Both spandex and powernet can come in various weights and strengths. Some powernet is fine and light and very stretchy or 'spongy'. Other powernet is very heavy-duty fabric that requires strength to stretch. Powernet has a matt surface finish, where as spandex is a lustrous knit. Spandex is sometimes called Satin Powernet. The powernet or spandex in the bra back of the bra can be doubled or self-lined to provide extra firmness, support and garment life. Alternatively you may wish to cover the powernet or spandex in the bra back with a layer of stretch lace (the greatest stretch in the lace must also go around the body). Covering the bra back with stretch lace obtains 'the best of both worlds'. The bra back possesses the firmness and strength of the underlying fabric as well as the beauty and delicacy of the lace pattern.

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### **Padding**

If you wish to pad a bra there are three options to choose from

1. ***Pad the total cup***
2. ***Pad the lower-cup only***
3. ***Make a small elliptical (fish-shaped) padded form***, which can be inserted into a ***very fine knit 'pocket' behind the lower-cup***.

Bra manufacturers commonly use a fine padding in their padded bras that comprises of fine polyester wadding that is bonded or fused to a fine nylon knit. In a manufactured bra, the raw wadding surface ends up being wedged in between the outer cup fabric and the nylon knit, and the nylon knit ends up being next to the skin. This bonded wadding is usually unobtainable to the home sewer, as it is especially produced for the bra manufacturers, but if this is the case, you can make your own bonded padding by:

- ***ironing a good quality iron-on nylon knit interfacing to the raw wadding, or***
- ***using fusible webbing to bond a knit fabric to one or both sides of the raw wadding***. The ideal bonding fabric is fine and flexible: single-knit tricot or a light, polyester/cotton knit. (Using this option, we can produce our own bonded wadding but we have a greater choice over the bonding fabric itself).

Doing either of the above will make at least one side of the raw wadding smooth enough to be worn next to the skin, but when in either process, take care not to use too much pressure on the iron, as excessive pressure can flatten the wadding.

Different thicknesses of polyester wadding can be purchased, so choose one of identical thickness/loft of the padding that is in the manufactured bra you have drafted your pattern from, erring on the lighter rather than the more bulky side. A much thicker padding can easily make the cup too small. A lightweight, finer wadding (similar to that used to pad photo frames in craft work) is better than very thick wadding.

Keep in mind that ***the type of padding used by the bra manufacturers has its own stretch/give properties and this overall stretchability must be faithfully reproduced in the padded bras that you make if the same fit and shaping of the garment is to be maintained***. The wadding itself often has a one-way give, as does the bonding fabric, so the relative positioning of the

two directions of greatest give will either produce a padding containing a one-way give, or virtually no give at all.

I have found that most padded bra cups have an inner padding cup layer, and an outer fabric/lace layer, and that ***the patterns of these two layers of the cup are completely different***. These bras are often the very successful 'push-up' or breast maximiser types of bras, and ***the shapes of all the cup pieces, as well as the direction of the 'give' in the cup sections is of critical importance***, affecting the shape of the breast in the finished bra.

Using an elliptical shaped padded piece inserted behind the lower cup creates even thicker padding in the lower cup without increasing the seam line bulk. The easiest way to make this padded piece seems to be to overlock all the layers together into a shape that is the right size. This is one of the few areas of bra making that appreciate the use of an overlocker/serger. The outer fabric layers and the padding layers are all held securely together, compressed at the edges then beautifully finished off.

To enhance the size of the breasts it is essential that a padded bra cup be a little on the loose-fitting side. If the cup is too 'snug' a fit, the available breast tissue can be flattened against the rib cage, defeating the whole purpose of the bra. In order to maximise breast appearance it also helps to have front strap attachment points moved a little away from the centre of the bra towards the arms so that the support points pull on the side of the breast. This allows the centre of the breast to fall forward and inward, enhancing the cleavage. To ensure that the straps don't fall off the shoulders the back strap attachment points should be very close to the centre back of the bra.

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## Edging Elastic and its Applications

The elastic for the upper edges of a bra is approximately ½ inch or 11mm wide plush lingerie elastic (scalloped or picot-edged elastic). This type of elastic may have a decorative scalloped or picot edge and it has a felt-like surface that ends up being next to the skin when the bra is worn. The elastic for the total lower edge is normally wider elastic of the same type, being commonly 16mm, or 19mm wide. Some non- underwired bras in the larger

sizes have very wide lower edge elastic that is 30mm or 35mm wide. Manufacturers often skimp on the elastic used in the bras they make, and use narrow scalloped elastic around the lower edge of the bra as well as along the upper edges of the bra, especially in the smaller sizes. Although this helps to give a bra a petite, delicate appearance, the narrower lower edge elastic fails to substantially support and strengthen the bra back, producing a weaker bra back and a reduced garment life.

***As a general rule, edging elastic should be sewn on unstretched***, except perhaps at the side of the upper cup, where a slight gathering-in of the front of the armhole edge can prevent any gaping. Note: If the cup fabric is fairly rigid, I prefer to build a snug fit around the armhole edge into the pattern itself, because no matter how strong the elastic that finishes off the armhole edge, it will fatigue with wear, allowing the armhole edge to gape.

In smaller sized manufactured bras that contain stretch lace or lycra in the bra back, both the upper and lower edges of the bra back are often gathered in by the edging elastic, producing a very pretty effect.

***If you are replicating a successful manufactured bra that contains substantial gathering-in by the edging elastic, when you are sewing your new bras, stretch the elastic likewise to produce the same amount of gathering.*** Observe the position of the gathering, measure the unstretched, finished length of the elastic sewn to the intact gathered-in edge, and write this measurement onto your pattern in the appropriate place. In this way you can cut and use the same length of elastic when finishing off that edge. When sewing the elastic to the edge stretched, in order to produce gathering, ***try not to sew through the elastic when it is in a fully stretched state.*** Always allow the elastic to relax a little before stitching it. If you sew through the elastic when it is fully stretched, the lines of stitching can actually hold the elastic extended out in its fully stretched state (which is why an elasticised edge can sometimes end up waved and stretched, with the return/memory in the elastic destroyed). To guard against this happening, try the following technique. This technique should be applied to both lines of stitching.

- Lower your sewing machine needle through both the elastic and the fabric. To sew elastic to a garment, always engage your needle-down

- position on your sewing machine (if it has that capability).
- While firmly holding the matched-up  $\frac{1}{4}$ ,  $\frac{1}{2}$  or  $\frac{3}{4}$  way point where the two are pinned together, stretch the elastic only just as much as required (pulling it toward you until the fabric under the elastic is flat).
  - Lower the pinned point down onto the sewing table of your sewing machine, and holding the pinned point firmly against the flat surface, move the pinned point slightly back in towards the machine needle (only a very small distance) so that the elastic can slightly relax. When you do this, the fabric under the elastic will concertina just a fraction (if it does so too much, puckering will result).
  - With your other hand, hold the fabric and elastic behind the machine needle (to maintain tension in the elastic), and then sew your line of stitching, allowing the sewing machine to feed the garment through at its own rate.

Using this method, the elastic is never sewn in its fully stretched state. Relaxing the elastic just that little bit before it is sewn can make all the difference to the finish of the garment, producing a professional-like rather than an amateur-like appearance.

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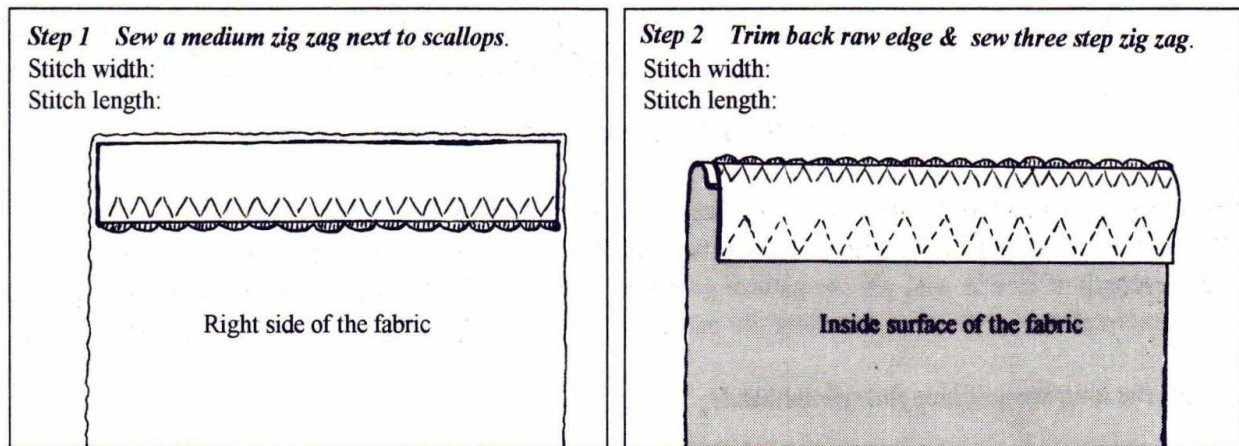
### ***APPLYING EDGING ELASTIC***

Narrow scalloped or picot-edged elastic is used as a finish on any upper edge of a bra.

Wider scalloped or picot-edged elastic of the same type is normally used as a finish on the lower edge of a bra. The only part of a bra where this edging elastic is normally stretched as it is being sewn, is at the side of the upper cup, where a little gathering can prevent gaping at the front of the armhole. Both the narrow and wide scalloped elastic are sewn to a bra using exactly the same technique. The technique is:

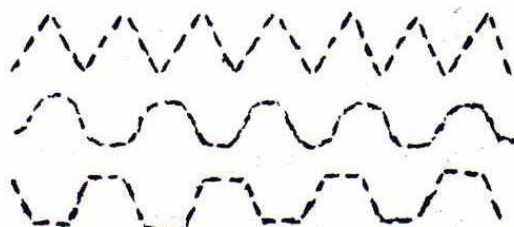
- Place the elastic on the ***right-side surface*** of the bra fabric, along the edge to be finished.
  - The straight side of the elastic should be flush with the raw edge of the fabric.

- The **plush or felt-like surface of the elastic should be facing upwards.**
- The **scalloped or picot edge of the elastic should be nearest the bulk of the garment.**
- **Using a medium zig zag, positioned so that its tips are just touching the scalloped or picot edge of the elastic, sew the elastic to the fabric.** Diagram 1. I suggest a stitch width of 3.5 and a length of 2 for this medium zig zag. Note: If the zig zag stitches are not positioned very close to the scallops, but are incorrectly positioned towards the middle of the elastic, too much elastic will be revealed when the elastic is later turned to the inside of the bra.



- Using a sharp pair of fabric trimming scissors, **trim the raw edge of the fabric back to the first line of stitching.** Trimming back the raw edge minimises bulk and ensures a neat finish.
- **Turn the elastic to the inside of the bra,** so that only the scalloped edge is showing from the right side.

The second line of stitching requires one of the following types of stitches (actual size): three-step zig zag, serpentine stitch (or a wave stitch), universal stitch or just a normal zig zag.





Of these four types of stitches, the three-step zig zag would be my first choice. I use the widest stitch width that my machine will produce (5) and a small stitch length setting (1) however all sewing machines are a little different, so adjust your stitch so that its shape is like the above sample.

- After selecting your stitch and adjusting the stitch width and length settings, ***anchor the elastic to the back of the fabric by sewing a line of this type of stitching along the opposite edge of the elastic.***

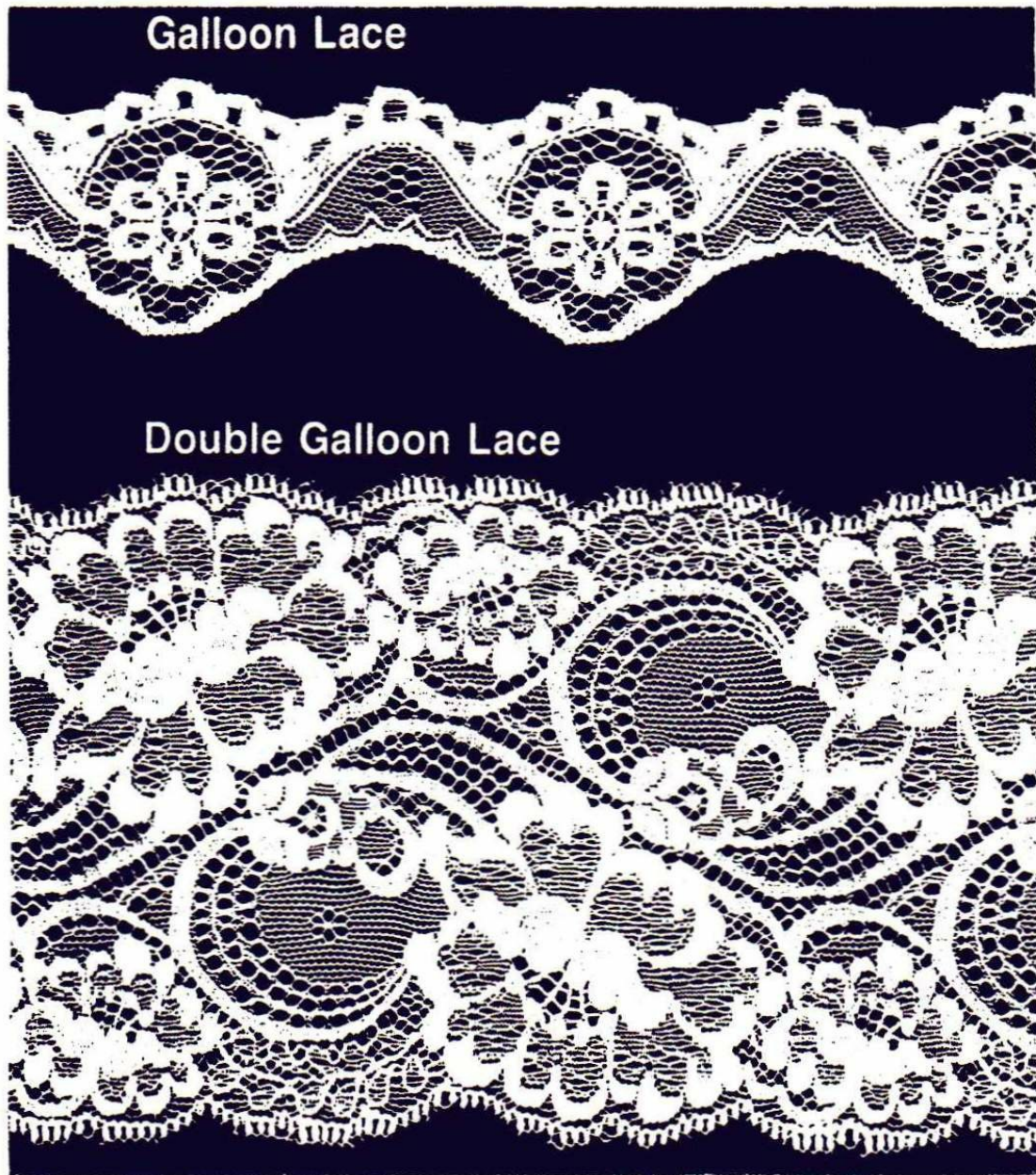
Position your stitches so that they sit ***right on the straight edge*** of the elastic. Diagram 2. When sewing this second line of stitching, do not go off the edge of the elastic. This second line of stitching will have to be sewn with the inside of the garment facing upwards so that you can ensure that the stitches are correctly positioned on the edge of the elastic. A correctly positioned second line of stitching will not allow the lower edge elastic to roll over and cut in when the bra is worn. Record your sewing machine's stitch width and length settings for both the medium zig zag and the three-step zig zag in the so that these settings can be easily remembered.

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## Lace and Lace Pattern Matching

### ***EDGING LACE***

The edging lace mostly used to edge the top of the upper-cup is called galloon lace. Galloon laces have two scalloped edges. The straighter, more even edge of the lace generally sits on the finished neckline edge of the cups. Double galloon lace can be cut in half length-wise following the space in between the motifs, to create two strips of narrower lace. Each narrow strip of lace will be a mirror image of the pattern in the other strip, so use one strip of lace for one cup and the other strip of lace for the other cup. In this way, the pattern in the lace on one cup will be the mirror image of the lace pattern on the other cup. If you are cutting your cup pieces out of strip lace, and you want the lace pattern on one cup to be the mirror image of the pattern on the other cup, you will have to pattern-match your lace before you cut the cup pieces out.



### ***HOW TO PATTERN-MATCH LACE***

Because many lace patterns are not symmetrical, and because the pattern in the top half of a strip of lace often runs in the opposite direction to the pattern in the lower half of the strip of lace, we can't simply fold the length of lace in half, pin the pattern pieces onto the double-thickness lace and cut the cup pieces out. This is a simple method of matching the pattern in your self-edged lace, before the pieces are cut out.

1. Lay the long strip of lace **face downwards**.
2. Pick up the raw edge of the lace that lies to your right and bring it across to meet the raw lace edge that lies to your left, so that the length of lace is folded in half.
3. Using a pair of scissors **cut along the fold in the lace** (which will lie to your right), so that the length of lace is cut in half. The half of the lace that is underneath will not be moved in any way ... only the half of the lace that lies on top will be moved.
4. With a hand at each end of the length of lace that is lying on top, **pick up the top piece of lace and rotate it 180 degrees** so that the raw edge of the lace that used to be to your left is now to your right, and vice versa. Note: **do not flip the top piece of lace over** when you do this ... the right-side surface of the lace should still remain facing upward. You should end up with two lengths of lace lying on top of each other on the table in front of you, with the wrong sides/inside surfaces of the lace together and the right-side surfaces of the lace against the table surface and facing upwards.
5. Looking through the open spaces in the lace pattern, move the length of lace that is lying on top from side to side, until the pattern in the top layer is directly over the same pattern in the underneath length of the lace. When the patterns in both are matched up, pin the two lengths of lace together.
6. Cut off any overhanging pieces at both ends. The cup pieces can now be pinned to the double-thickness lace and be cut out.

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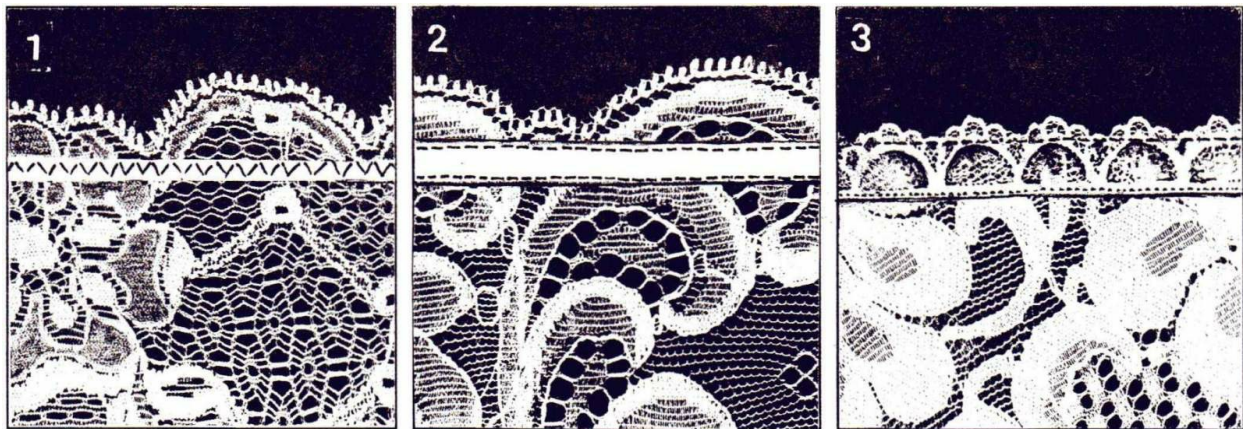
## Completing a Bra Cup's Neckline Edge

There are many ways of completing a neckline edge. Study the way in which the neckline edge in your pattern bra is completed, and either replicate this, or use a method that produces a neckline edge containing similar if not identical stretchability.

- **If the neckline edge is comprised of self-edged stretch lace**, it is often reinforced by an extremely narrow piece of 'plastic elastic' zigzagged to its inside edge at the base of the scallops in the lace. Diagram 1. 'Plastic elastic' is transparent polyurethane elastic that is



normally sold in 6mm and 9mm widths. If this is the type of neckline edge on your pattern bra, don't be tempted to substitute a wider elastic to reinforce the neckline edge, as doing this will make the neckline edge much stronger, and less pliable. (Wider elastic will introduce the possibility of the neckline edge pulling tightly across the breast, creating unsightly bulges on either side of it). To produce this extremely narrow width of plastic elastic, a wider piece of plastic elastic can be cut length-wise.



- ***If the neckline edge is comprised of self-edged non-stretch lace***, it is often reinforced by a piece of sheer tricot strip folded into thirds lengthways and edge stitched to the inside of the edge at the base of the scallops in the lace. Diagram 2. This strip of sheer tricot folded in three and stitched to the cup, contains a very slight give along its length. If you are not using an identical method of completing the neckline edge, it is important to use a method that allows the neckline edge to give slightly. With this aim, I recommend using ***a slightly loosened upper thread tension when edge stitching*** the chosen reinforcing strip to the inside edge of the neckline. As you can see, preventing the neckline edge from pulling tightly across the breast is very important. Sheer strip has the advantage in that it is almost transparent, and does not show behind the pattern of the lace, however it has a few major disadvantages. Firstly, it can irritate sensitive breast skin, and secondly, being made of such a fine, ephemeral fabric, it is very difficult to fold into three and edge stitch it all in the one operation. I am sure that the bra manufacturers have

a specific sewing machine that sews sheer strip to a garment, making its application very simple, but as home sewers, we only have our domestic sewing machines to use. Because of the above reasons, I never use sheer strip: either in reinforcing a neckline edge or in covering up the raw edges on the back of a bra cup (these are its two common uses).

Two alternative ways of replacing sheer tricot strip along a neckline edge are as follows. The first way, using trimmed narrow poly/cotton bias binding is my preferred method. It is a quick method and uses an inexpensive and readily available item, sold in a variety of colours.

***Edge-stitch a very narrow strip of poly/cotton bias binding across the inside of the neckline edge.*** To reduce the width of the bias binding cut off one of its folded-under side edges, cutting along the fabric's fold line. Fold the new cut edge under, so that the strip is folded lengthways into three and edge stitched onto the back of the neckline edge. Being cut on the bias, this method of reinforcing a neckline edge will allow the neckline edge to 'give' a little.

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- ***Edge stitch a very narrow strip of poly/cotton interlock across the inside of the neckline edge.***

Cut the strip out with its non-give direction going along the length of the strip. This knit strip can be folded into three and edge stitched, just like the original sheer tricot strip. Being a knit fabric, using a strip like this to reinforce a neckline edge, will still allow the edge to 'give' a little, even if its non-give direction runs along the neckline edge.

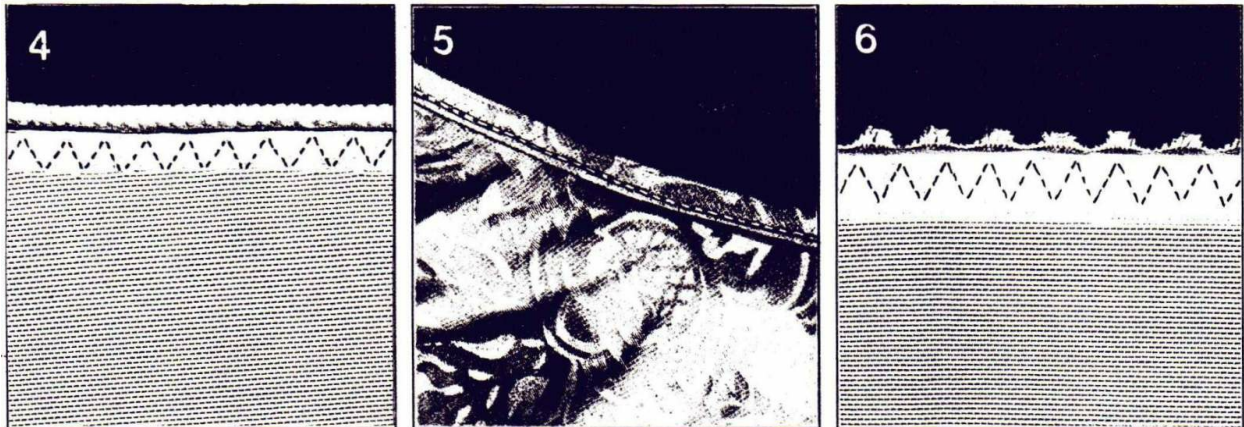
- ***If the neckline edge is a raw, cut edge*** it is often completed by edge stitched sheer tricot strip to the inside of the edge, and edge stitched narrow edging lace directly on top, to the outside of the edge. Diagram 3. There is no seam allowance along this type of neckline edge because there is no fabric turned under. The cut edge of the upper cup becomes the finished neckline edge. This type of

upper cup is commonly made out of a bonded lace, or the neckline portion of the upper cup is made of non-stretch lace. Because of the two strips sewn to the edge, this tends to be a fairly rigid edge, containing only a fraction of 'give'. To replicate this type of neckline edge, simply edge-stitch trimmed bias binding along the inside of the edge and edge-stitch a narrow edging lace along the right-side surface of the neckline edge.

- ***Sometimes a neckline is edged with stretch piping.*** Diagram 4. If this type of stretch piping is available, it can be sewn to the bra in the same way, as is narrow scalloped elastic. Refer to [page 97](#). I suggest that the first line of stitching be a tiny zig zag positioned right at the base of the 'pipe' so that a crisp fold in the fabric be produced. Stretch piping has previously been available with swimwear application in mind, and it may be rather hard to obtain today. If it is unavailable, substitute either non-stretch piping (if the neckline edge doesn't have to stretch or 'give') or narrow scalloped elastic (if some movement along the edge has to be retained). If you are substituting narrow scalloped elastic (Diagram 6) for the stretch piping, keep in mind that the very edge of the piping is the finished neckline edge of the pattern, and a 1cm seam allowance must be added above this line.
- ***If the neckline edge of the cup is bound with a very narrow rolled strip of lycra*** that is sewn around the raw edge of the cup fabric with a single line of straight stitching, this type of edge is produced by a specialised machine in the bra factories. Diagram 5. It is a finish commonly used on lycra or mirror satin cups and the line of straight stitching contains moderate stretch, due to the looseness of the tension and the type of thread used (probably woolly nylon). This type of edge finish is unsuitable for the home sewer to replicate. Not only is it too difficult to replicate, but it is not a strong edge that will last. I have seen many bras with this type of neckline edge where the line of straight stitching has broken (due to being stretched beyond its capability), and the fabric strip/binding has unrolled and come away from the cup, revealing the raw fabric edge of the upper cup. If your bra has this type of neckline edge, I suggest that you substitute either stretch piping or narrow scalloped elastic, applied



according to the instructions on [page 97](#).



**Helpful tip:** Whichever method is used to complete the neckline edge, ***always leave a centre front overhang of the elastic, edging lace or tape that was used***, so that it can be trimmed off flush with the wire line raw edge of the cup fabric.

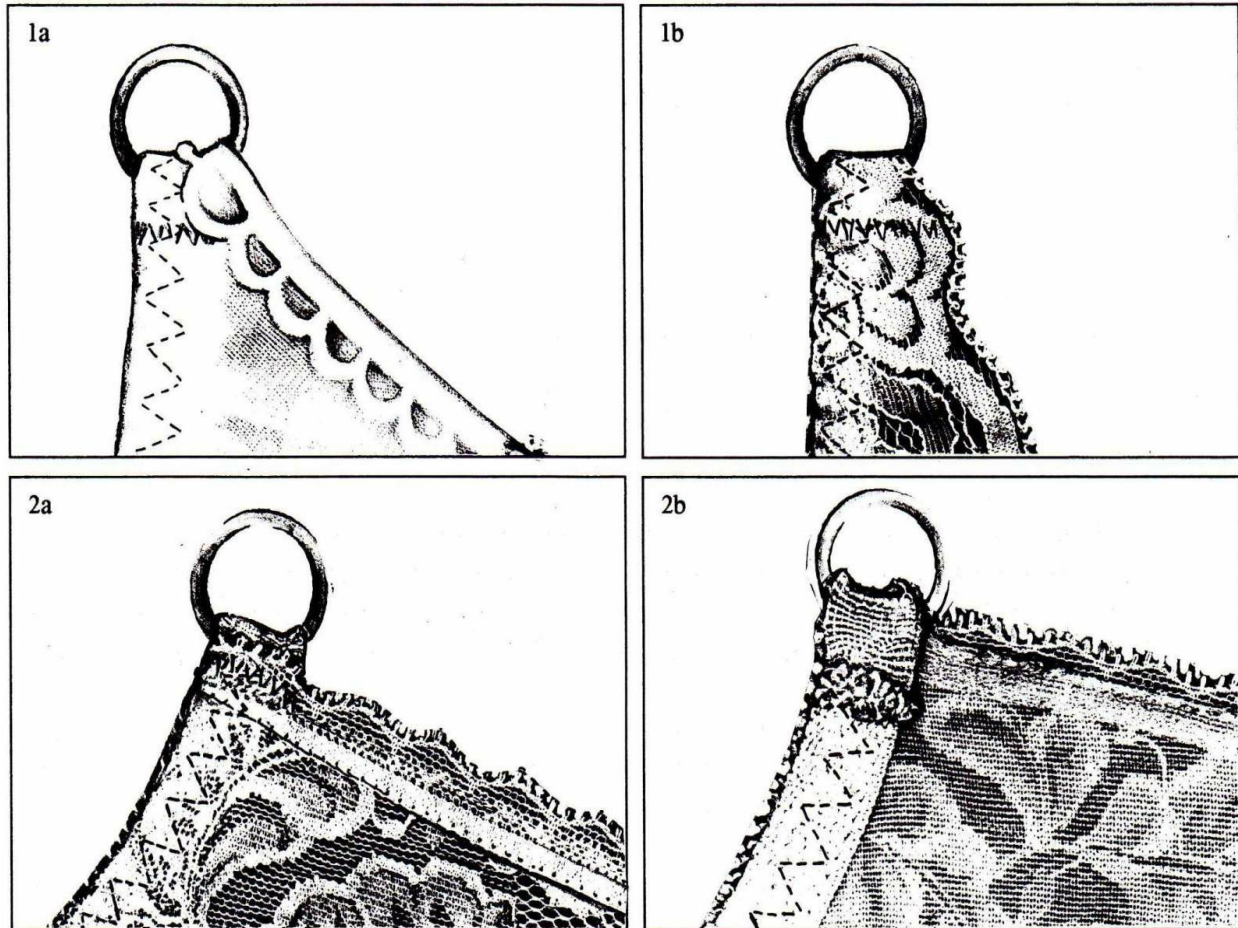
[page 101]

## Sewing Rings to the Top of the Cups: Front-Adjusting Bra

If your bra straps are ***front adjusting***, you will need to sew rings to the top of the cups. There are two usual ways of doing this.

- The first method is simply to thread the top point of the cup through the ring, and to sew the end securely. Diagram 1a. Diagram 1b illustrates a variation of this method. For a bra style that has a lace or padded fabric strap sewn to the top of the upper cup, then thread the end through the ring and sew the end securely. This type of join between the cup and the strap is a very substantial one, making this method a favourite for large cupped bras where the need is for a strong garment.
- The second method is illustrated in diagram 2a. Using this method, the ring is attached to the upper cup with the armhole edge elastic: When the armhole edge is elasticised, an elastic overhang is left at the top of the cup. The end of the elastic is threaded through the ring, and stitched securely to the back surface of the upper cup. Whilst this method gives a delicate, petite appearance to this part of the bra, it has the disadvantage of producing a weak point in the bra.

Over a period of time, the ring swivels around and ends up weakening and eventually cutting through the elastic loop that joins the bra strap to the upper cup. Diagram 2b shows the way the elastic is stressed and worn at this vulnerable point in the bra's design. To strengthen and therefore improve this method of attaching the cup to the bra strap, I recommend that a short length of sturdy non-stretch tape be used to reinforce the elastic that is to be threaded through the ring. To accomplish this, once the narrow scalloped elastic is sewn to the armhole edge with the first line of stitching (the medium zig zag next to the scallops), lay the length of tape at the back of the elastic overhang (against its felt-like surface). Ensure that the cup-end of the reinforcing tape is a little below the top neckline edge of the cup. Securely edge stitch the tape to the back of the elastic overhang using two lines of small straight stitches. Once the raw armhole edge of the cup fabric is trimmed back and the second line of stitching is complete (the three-step zig zag), the reinforced section of elastic can be threaded through the ring and the end can be stitched securely to the back of the upper cup.



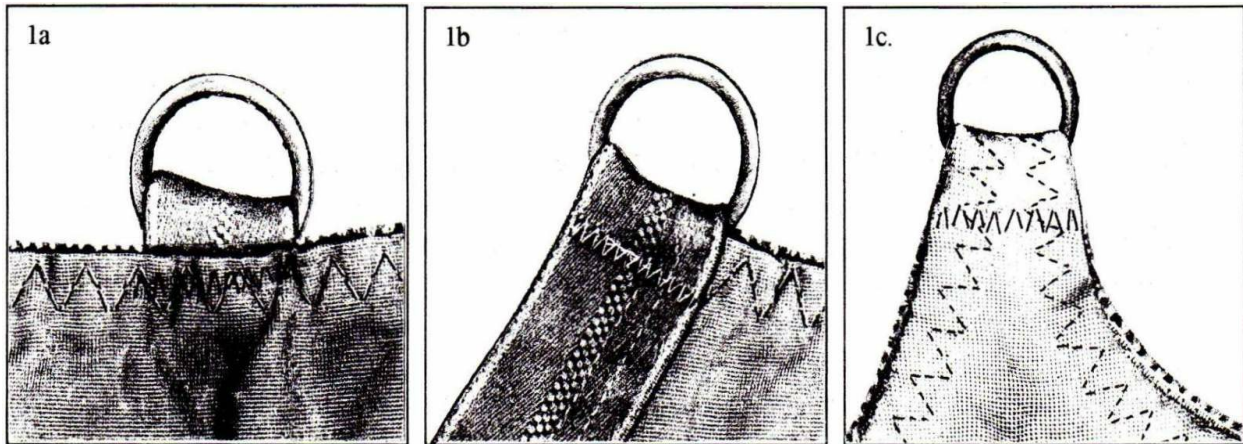
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## Sewing Rings to the Top of the Cups: Back-Adjusting Bra

If your bra straps are **back adjusting**, **the rings will be sewn to the back of the bra** instead of to the front of the bra. Later on, when each strap is fully assembled it will be threaded through the ring and the other end of the strap will be sewn directly to the top point of the upper cup.

In a **T intersection style of bra back**, a short piece of strap elastic is threaded through the ring, and this elastic loop is securely sewn behind the top edge of the bra back. Diagram 1a.

In a regular style of bra back where the straps are back adjusting, there are two style variations.



- The piece of strap elastic that is sewn to the edge that leads down to the closure, is threaded through the ring and sewn securely to the underside of the bra back (Diagram 1b). If constructing this type of bra, when sewing this piece of strap elastic to the bra back, leave an overhang at the top edge of the bra back that can be looped through the ring and sewn. Keep in mind that the piece of strap elastic that loops through the ring and leads down to the closure need not be as wide as the bra straps. A narrower piece of strap will be a little more flexible, adjusting to the curved edge that leads down to the closure better than a wider piece of strapping. Of these two methods of attaching the ring to the bra back, this first option is the one that produces the stronger, longer-lasting, better-designed bra back (the strapping reinforces the centre back area).
- the edge that leads down to the closure is finished with narrow scalloped elastic, and the top point of the fabric is threaded through the ring and sewn securely. Diagram 1c.

Before simply finishing off the top edge of the bra back and attaching the rings, thought must be given to the way the bra back's upper edge meets the closure tabs (the hook and eye tabs). A professional finish to this part of a bra will only be obtained if the top edge of the bra back continues on into the top edge of each closure tab. The following diagrams (as well as [pages 106](#) and [107](#)) illustrate my method for ensuring this type of neat finish.

If the bra you are making has a bra back that is a ***T intersection style*** (similar to diagram 1a), to correctly position the narrow scalloped elastic that will finish off the top edge of the bra back,

- ***the closure tabs must be cut to length,***
- ***the eye tab must be correctly positioned against each centre back edge*** (similar to how it will be in the finished bra: with the bottom edge of the tab level with the finished lower edge of the bra back, and its flaps opened and wrapped around the raw edge at the centre back). Diagram 2a.
- ***the top corner of the flap of the eye tab should be marked with a fabric marking pen.*** This point is the red point in diagram 2b.

Note: When applying the narrow scalloped elastic to the top edge of the bra back (before the first line of stitching is begun), the elastic should be positioned on the bra back fabric so that the base of the scalloped edge exactly meets this point. Diagram 2c.

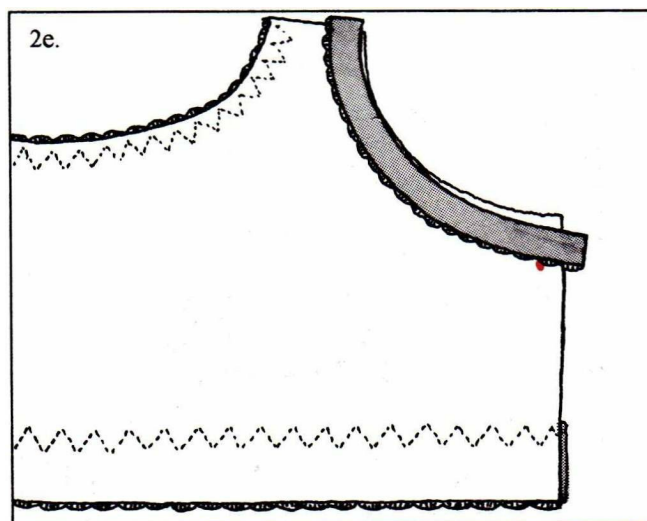
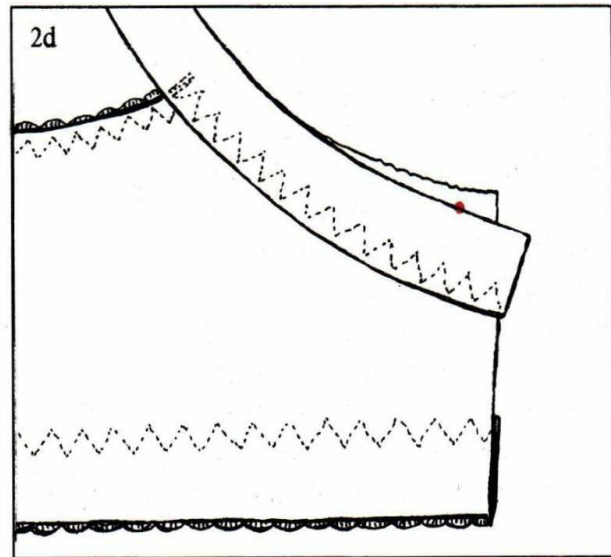
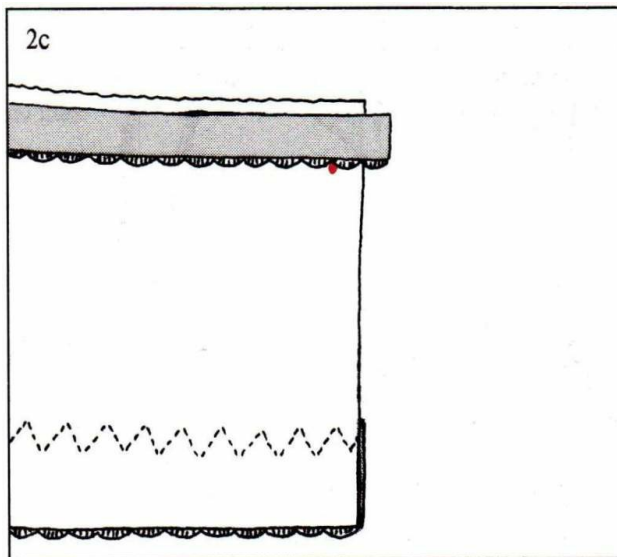
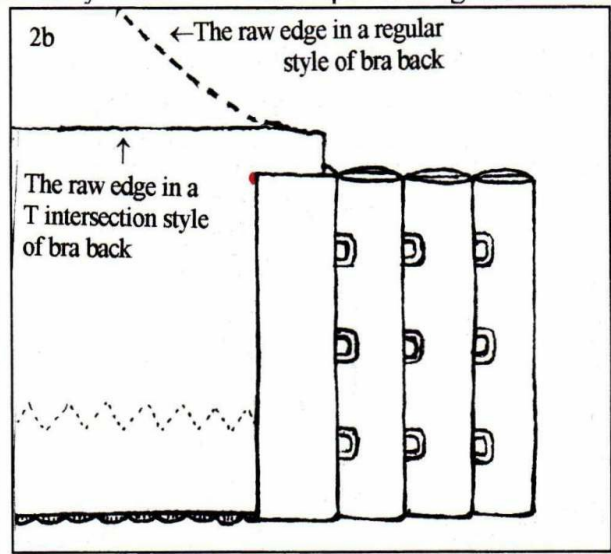
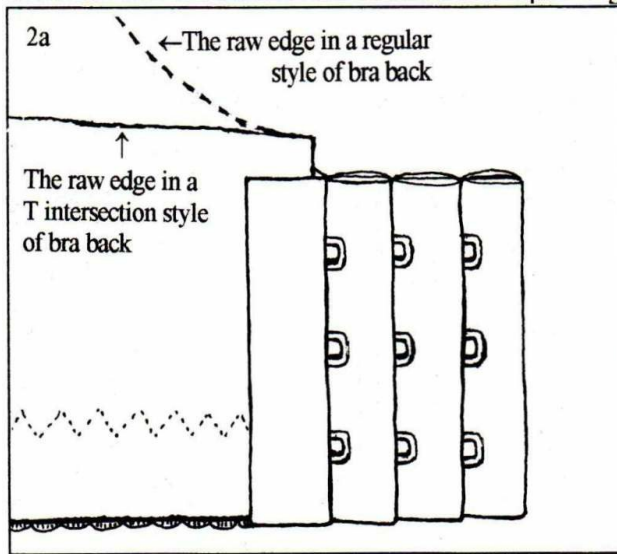
This same method applies if the bra you are making has a bra back that is a regular style (being similar to either 1b or 1c). Before finishing off the top fabric edge that leads down to the closure,

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- the closure tabs are to be cut to the right length,
- the eye tab should be positioned against each centre back edge (wrapping the flaps of the eye tab around each raw edge). Diagram 2a.
- the top corner of the flap of the eye tab should be marked with a fabric marking pen. Diagram 2b. This is the point at which the top of the tab meets the finished edge that leads down to it. If your bra back is similar to 1b, the length of strap elastic should be positioned so that its top edge will exactly meet this marked point Diagram 2d.

If your bra back is similar to 1c, the narrow scalloped elastic should be positioned on the bra back fabric so that the base of the elastic's scalloped edge exactly meets this marked point. Diagram 2e.



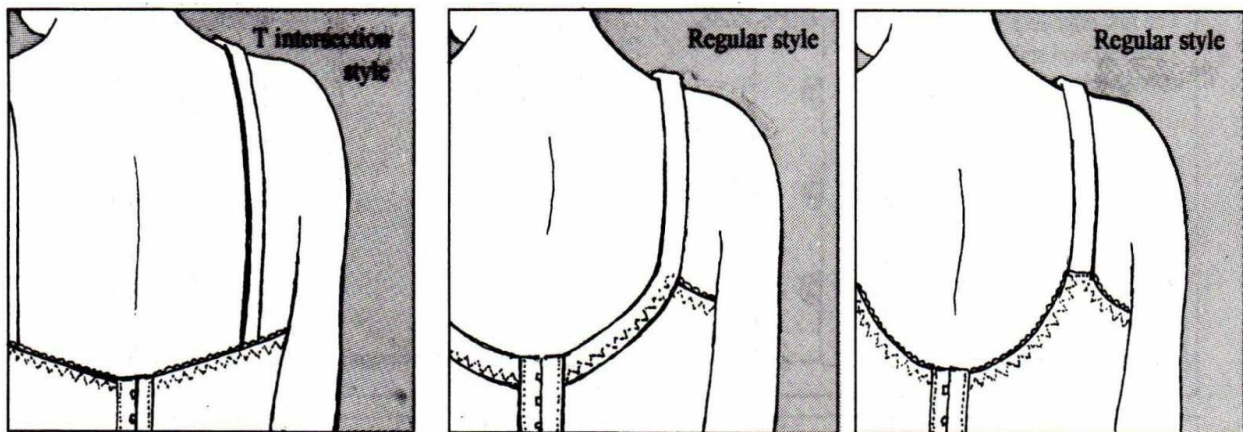




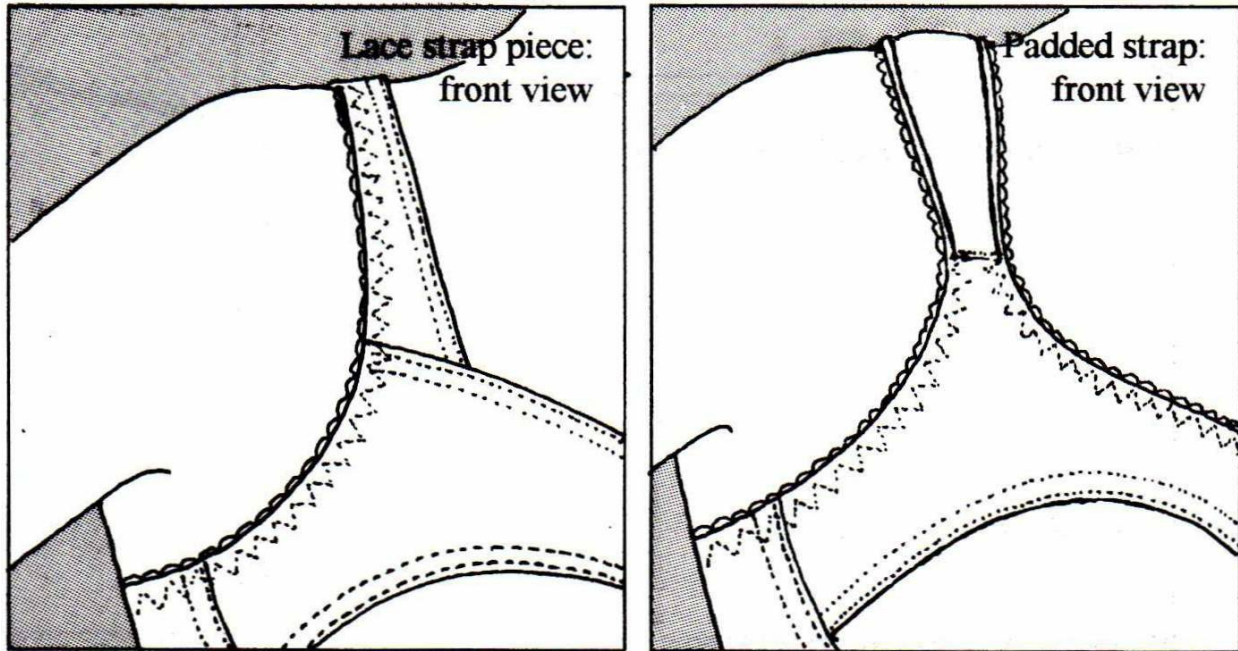
## Bras Straps and Their Assembly

The importance of having wide, good quality shoulder straps on your everyday bras should be self-evident. When 'ditches' have been dug into the top of the shoulders, they can't be miraculously filled in, making prevention of the problem a lot easier than the cure. I used to think that only large breasted women had such ditches at the tops of their shoulders, until I saw the shoulders of a petite 12B (34B) client of mine. Her deep grooves had been partially caused by the fact that she did her bra straps up so tightly! Better quality elastic in her bra straps could have prevented the deep grooves from forming. Bra straps can be either front adjusting or back adjusting.

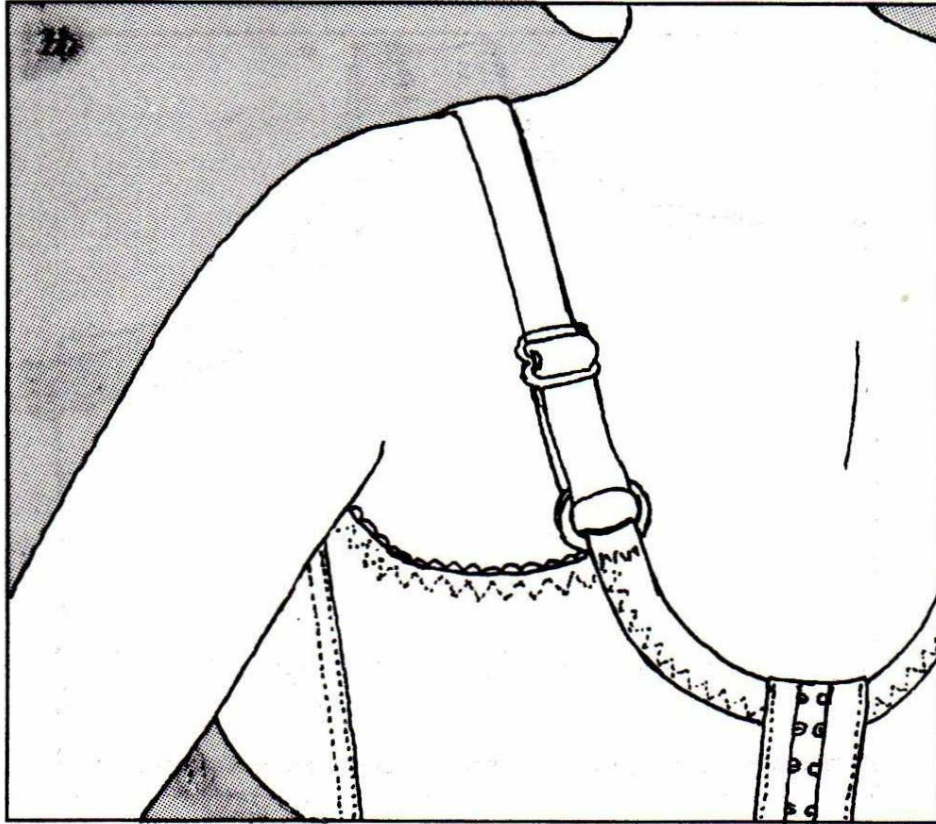
In a bra with **front adjusting** bra straps, **the ring is sewn to the front of the bra**. Once each strap is assembled (threaded through both the ring and the slide), the strap end is sewn directly to the bra back. Care must be taken to ensure that the strap is not twisted before its end is sewn to the bra.



Should there be a lace strap piece that is sewn to the upper cup, the position of the ring may be at the top of the shoulder, and the slide can actually be on the back of the shoulder. This type of bra is still front adjusting. The lace strap piece is just an extension of the top of the upper cup. In a similar way, a padded fabric strap may be sewn to the upper cup, creating another form of front adjusting bra.



In a bra with **back adjusting** bra straps, ***the ring is sewn to the back of the bra***. Once each strap is assembled (threaded through both the ring and the slide), the strap end is sewn directly to the front of the bra. Care must be taken to ensure that the strap is not twisted before its end is sewn to the bra.



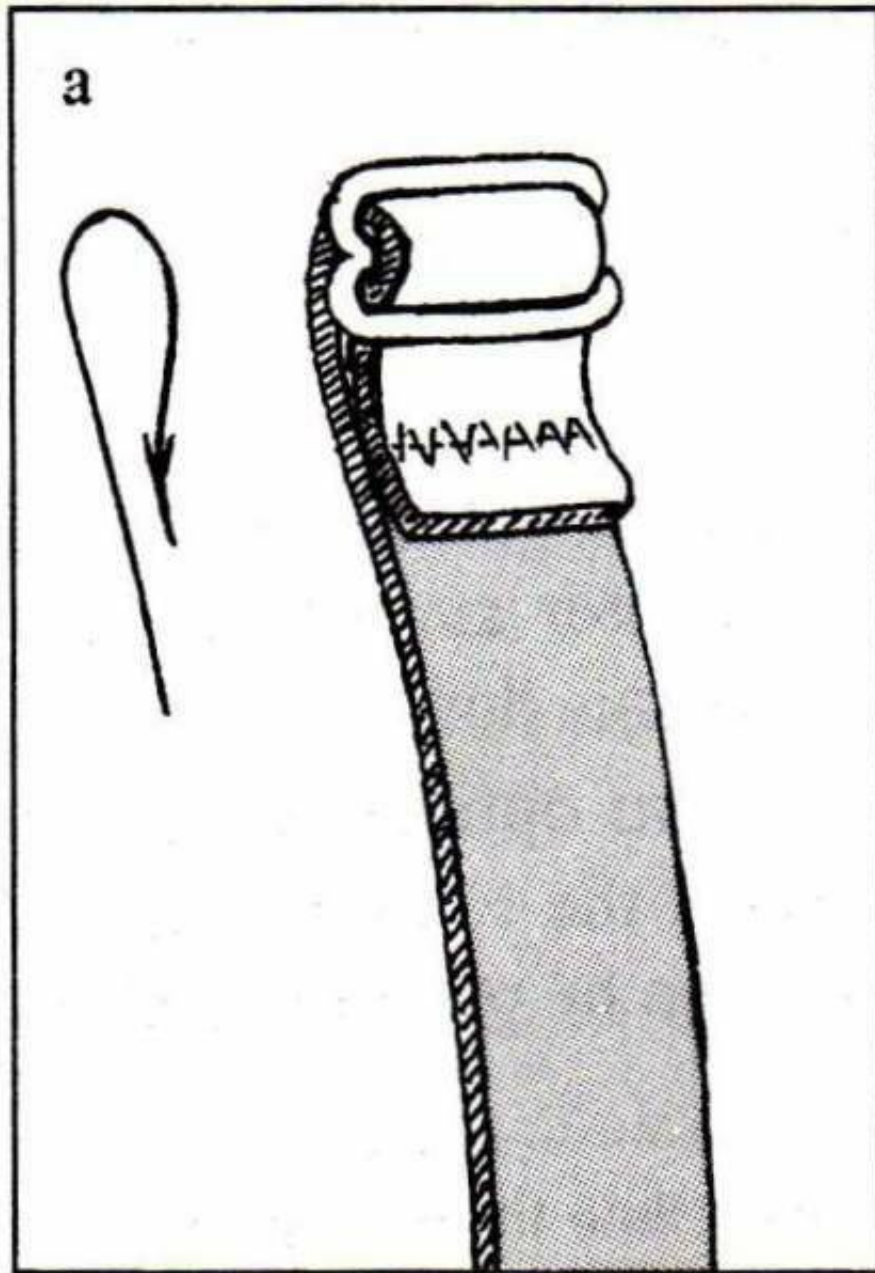
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### ***ASSEMBLING THE STRAPS***

Whether your bra straps are front adjusting or back adjusting, the straps are assembled in exactly the same way. The following instructions apply to both types of bras. The only difference will be in step three below. When threading the strap through the ring in a back adjusting bra, the right side of the bra back fabric will be facing upwards, whereas in a front adjusting bra, the right side of the cup fabric will be facing upwards.

1. Cut your elastic straps to the correct length. If you are replicating a manufactured bra, measure the length of strap the manufacturers have used and cut two pieces that same length. If you are using a commercial bra pattern, the pattern should specify the length of the straps. The typical length of each strap should be between 45cm and 50cm (17.5 - 19.5 inches). The strap length depends on the amount of stretch in the strap elastic, how tall the figure is, and the style of the strap itself.

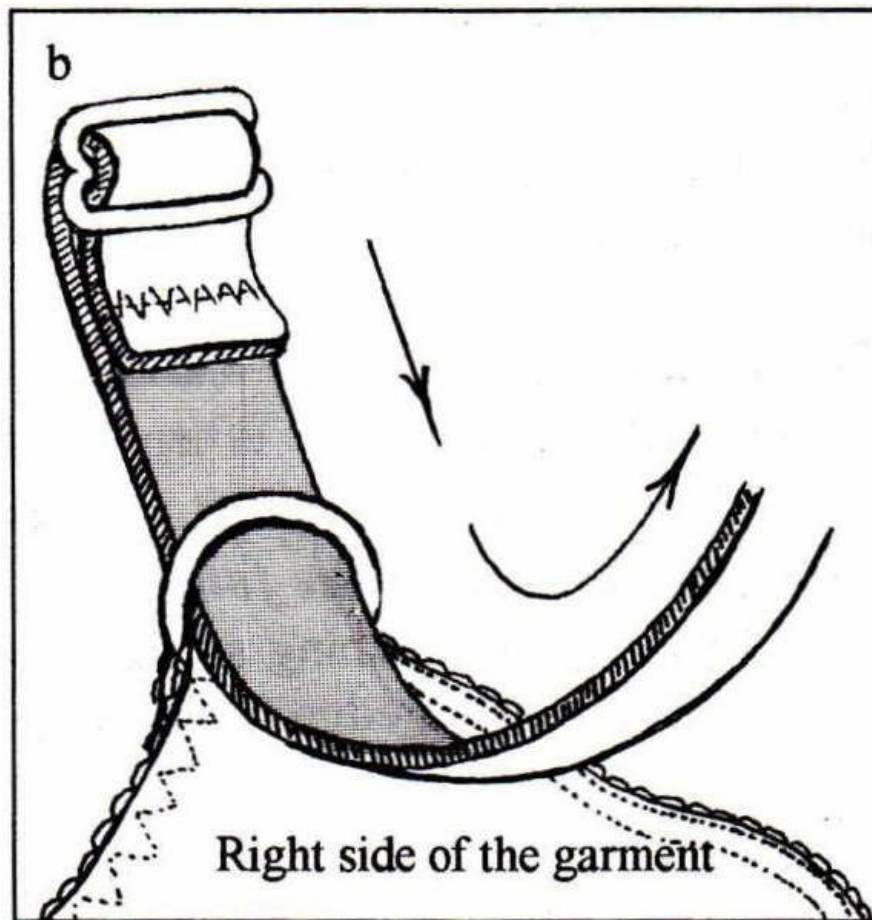
2. Loop one end of the strap around the central bar of the slide, threading just enough strap around the bar so that the end can be stitched. Stitch the end securely to the strap. I find that a medium zig zag stitch with a straight stitch reversed back over it is a very secure stitch to use. Diagram a. Note: in these diagrams, the underside of the strap is the darker side.



3. Position one of the rings in front of you, with the right side of the garment facing upwards.

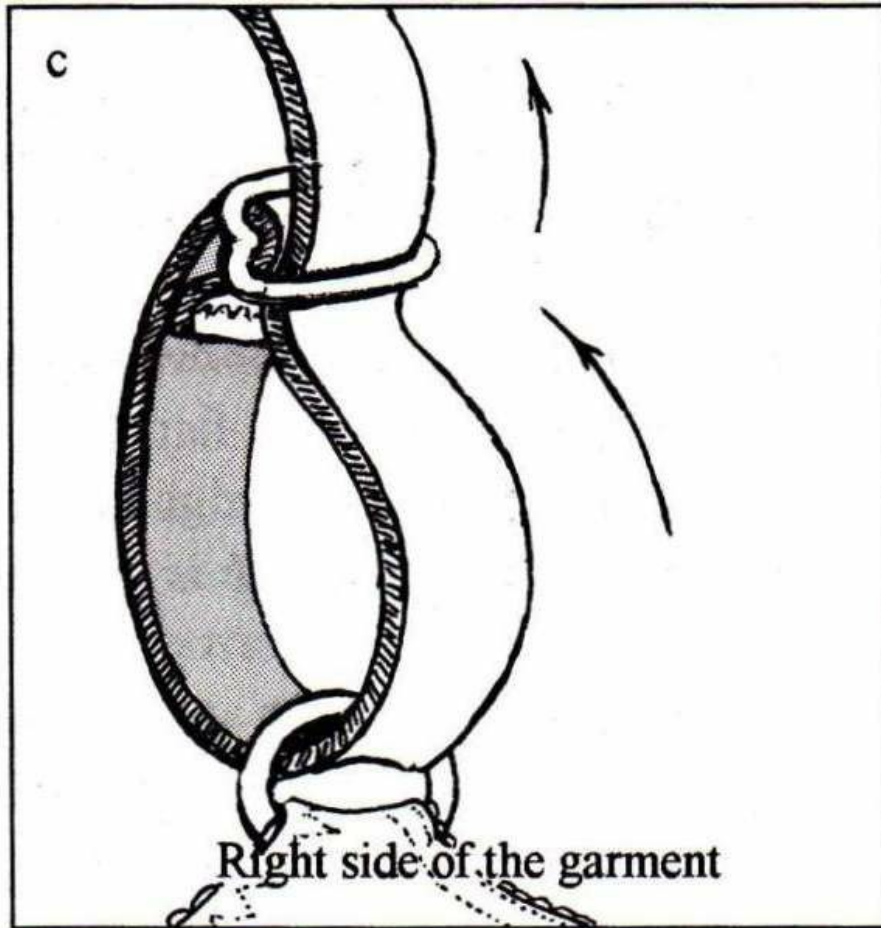
***With the strap face-down, thread the end of the strap from behind the***

***ring, drawing it through the ring toward you, until the majority of the strap has passed through the ring. Diagram b.***



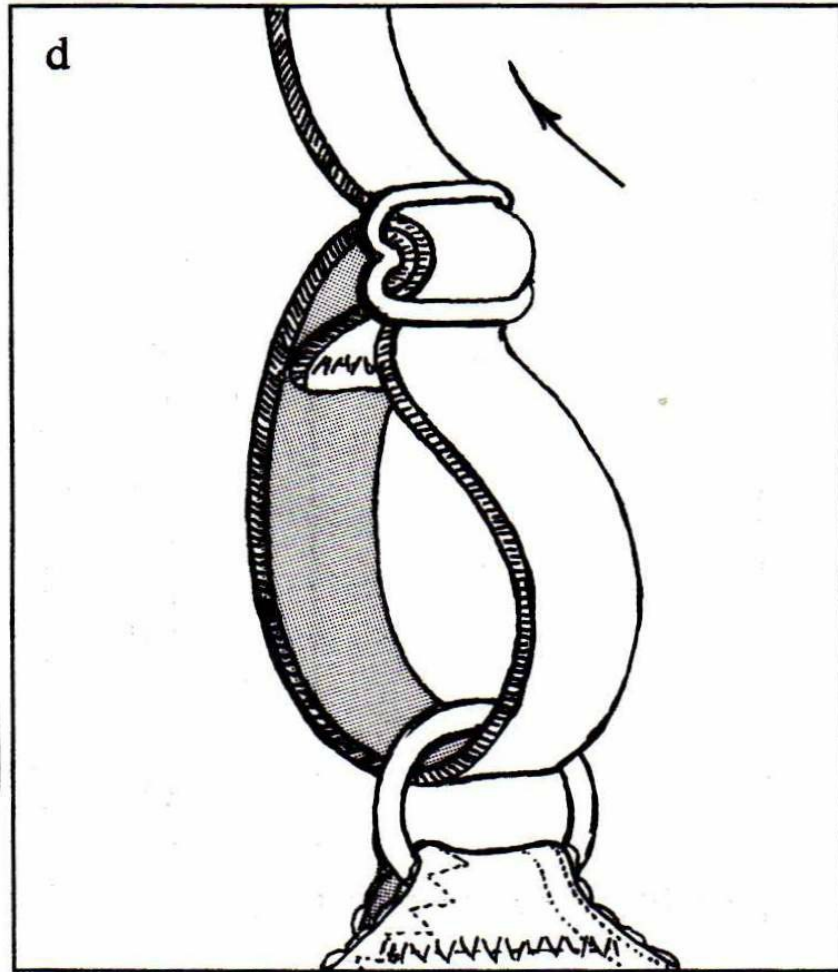
4. Thread the end of the strap up under the front bar of the slide, pulling the majority of the strap under the front bar so that there is an equal length of strap between the slide and the ring at the back and the front. Diagram c.





5. Thread the end of the strap over the central bar, and down under the back bar of the slide, drawing the full length of the strap through. Diagram d.





6. The raw end of the strap can now be sewn to the: the top of the cup (if your bra straps are back adjusting), or the raw edge leading down to the closure (if your bra straps are front adjusting). Before you sew the end of the strap, ensure that each strap is untwisted. If the strap is mistakenly sewn on twisted, your stitching will have to be unpicked.

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### Sewing the Straps to the Bra Back

If your bra straps are front adjusting, and the style of the bra back is a regular style, with the end of the strap sewn to the curved edge that leads down to the closure, care must be taken to ensure that the top edge of each strap continues on neatly into the top edge of the closure tab. This is necessary in order to produce a professional finish to the bra. Note: In the following diagrams, the type of bra back that is illustrated is a regular style

(strap sewn to the edge that leads down to the closure), however the same principles apply to other styles of bras. Refer to [pages 102 & 103](#).

1. ***Cut your closure tabs to the right length*** according to what is written on the centre back closure edge on the pattern or the instructions in your commercial pattern.

Note: Hook and eye tape can be bought by the metre, and when cutting hook/eye tape into a closure tab, I like to give myself extra fabric/sewing space at the top and bottom of my tab, by cutting across the tape extremely close to the hooks/eyes on either end of the tab that I will be using.

Thus, when cutting a tab of say three hooks/eyes high, I will sacrifice the first and fifth hooks and eyes, but I will obtain a more substantial tab, thereby decreasing the risk of breaking my machine needle on the concealed metal anchor pieces within the tape itself.

Also note that different closure tabs as well as hook/eye tape, can have different spacings in between the hooks and eyes, so ***it is necessary to measure the height of the tab against the bra back***.

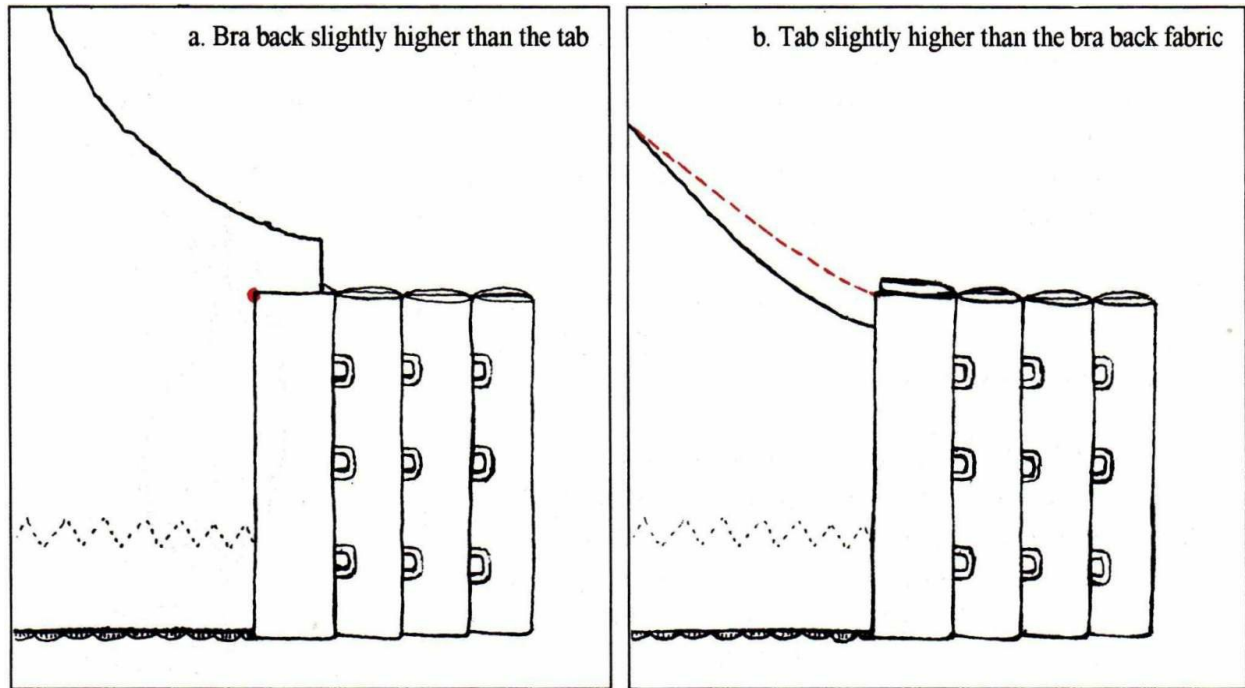
To determine the position of the strap on each side of the bra back, work through the following.

2. ***Position the eye tab as it will be in the finished bra***, with the raw lower edge of the tab level with the finished lower edge of the bra back: open the flaps of the eye tab and wrap the flaps around the raw edge at the centre back of your bra.

Note: if using a manufacturer's ready-made closure tab, break the heat-seal at the top and bottom of the flap, so that it will freely wrap around the raw edge.

- ***If there is fabric above the top of the tab***, using a fabric marking pen, mark a dot at the top left corner of the tab's flap (the red dot in the diagram a). When the strap is later sewn to the bra back, the very top edge of the strap will be positioned so that it is exactly on this dot.
- ***If the top of the tab is higher than the top edge of the fabric***, you have two options: either cut the tab slightly shorter, or position the strap for stitching so that it overlaps the top raw edge of the bra back by the appropriate space. The very top edge of the strap

will then be positioned along the red dotted line in diagram b.



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### 3. Sew each strap to the bra back.

Each strap is laid in its correct position, right-side up, on top of the bra back. This is a simple overlap where the underside of the strap will be against the right side of the bra back fabric. Pin the strap in position. Finally, **ensure that the strap is not misted between the bra front and the bra back**. Sew the strap to the bra back using a type of zig zag stitch: either a small to medium normal zig zag if your strapping is narrow, or a three-step zig zag/serpentine stitch if your strapping is wider.

***This line of stitching should be positioned along the lower edge of the strap.*** Diagram c.

Make sure you reverse your sewing, (producing a back stitch) at the point where the strap joins onto the bra back, as this is a stress area. If not securely sewn, the strap can tear away from the bra back.

4. ***Cut the end of the strap off at the correct angle*** (flush with the centre back fabric edge), ***and trim the excess fabric underneath the strap back to the line of stitching.*** Diagram d.

## The Closure (the Hooks and Eyes)

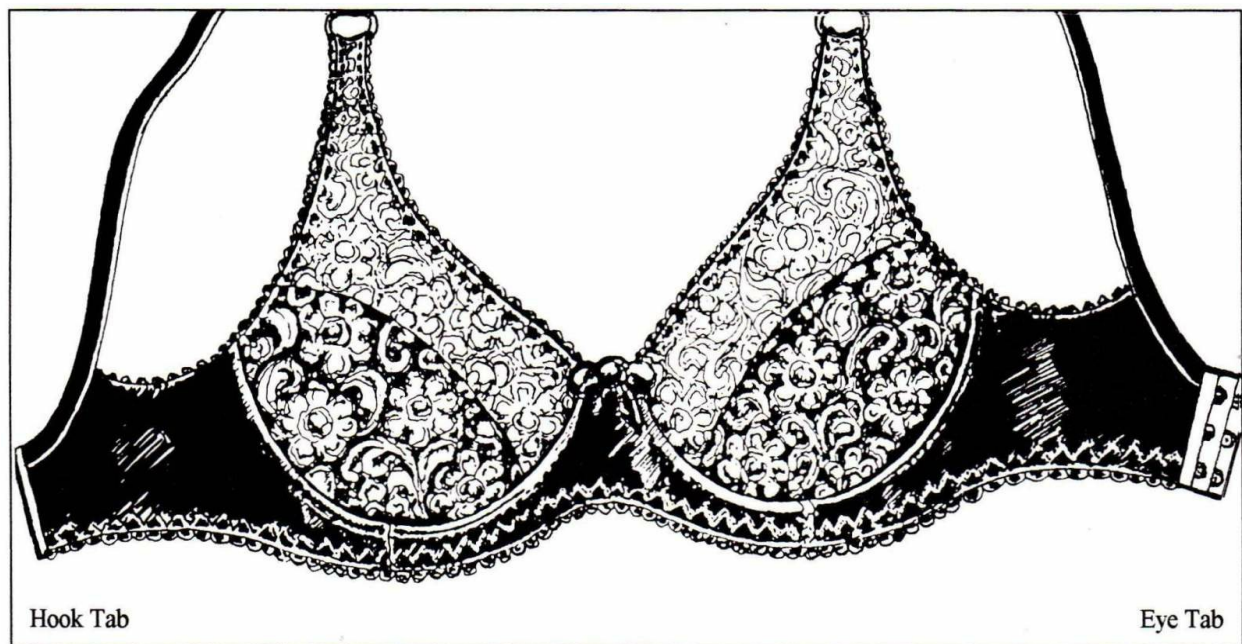
Petite women have told me that a bra with a 2 hooks/eyes high closure is more comfortable to wear than a bra that only has a single hook/eye closure. Other women have told me that a bra with a 3 hooks/eyes high closure is more comfortable to wear than a bra that only has a 2 hook/eye high closure. I long ago concluded that a more substantial bra back was very comfortable to wear, and I now wear bras with closures 5 hooks/eyes high. In a more substantial bra back, the tension/pressure is equally divided among the number of hooks/eyes in the closure, producing the conclusion that ***the hooks and eyes will last longer if the closure tab is more substantial.*** The closure tabs on a bra are not only affected by the design of the bra back, ***but the hooks in particular, are very vulnerable to poor laundering practices.*** If you machine-laundry your bras, it is vital that the hooks and eyes be done up, and then the bra folded in half with the closure in the centre of the folded garment. The folded bra should then be put into a small lingerie-washing bag, before being put into the washing machine. The lingerie bag should be only just big enough to fit the folded bra into it. If it is too large a bag, the bra has opportunity to become unfolded, the hooks and eyes can come undone, and the hooks have opportunity to snag other garments in the wash. If bras are either hand-washed or machine-laundered properly like this, the hooks and eyes are protected as much as possible and the hooks will not be bent out of shape and broken.

If the size of the bra you are making is plus-sized, and there is significant stress on the hooks and eyes, causing them to break or pull out of the tape, then I suggest that you use surgical corset hook and eye tape for your bra closure. The individual hooks and eyes in surgical hook/eye tape are made out of heavier gauge steel, and whilst not being petite and delicate in appearance, they are much stronger and will prolong garment life. Surgical corset eye tape is only single tape, so to produce eye tape with three adjustable positions, you will have to buy three times the height of your closure and sew the three strips of eye tape to a piece of backing fabric.

## Sewing the Eye Tab to Your Bra

The eye tab is sewn onto the left-body side of the bra. When the bra is lying

face-upwards on the table in front of you, the eye tab is sewn to the raw edge on your far right.



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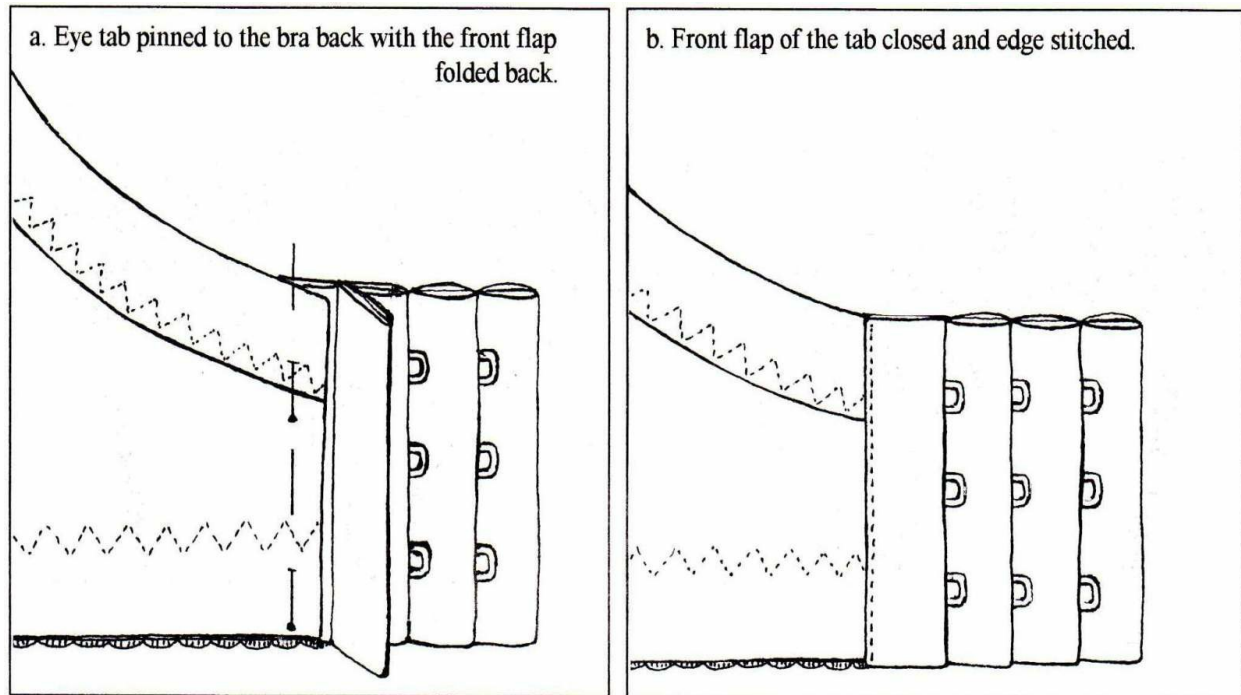
1. Position the eye tab as it will be in the finished bra, with both flaps of the tab wrapped around the raw closure edge. **Completely open the front flap, and insert a pin through the bra back fabric and the underlying back flap.**

The raw edge of the fabric should not quite reach the beginning of the folded-back upper flap ... this small gap will allow for the tab to neatly wrap around the thicknesses of the fabric and elastic.

Ensuring that the top and bottom edges of both the tab and the bra back meet exactly, and using a very small straight stitch, **sew a line of stitching approximately where the pin is.** Diagram b. This first line of stitching should be close to the edge of the underneath flap.


Note that the purpose of this first line of stitching is to correctly position the tab in relation to the bra back, ensuring a very neat, professional finish in the completed bra.



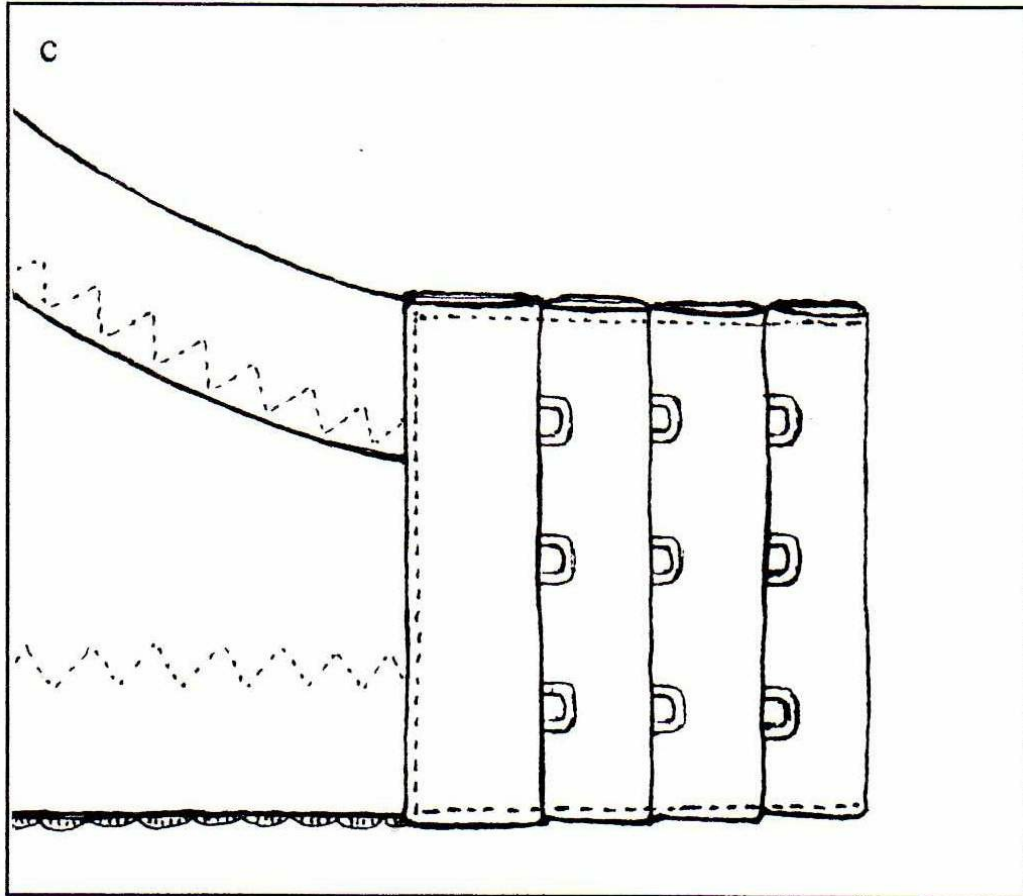


2. Close the front flap of the tab and ***sew through all layers along the very edge of the front flap***. Use a very small straight stitch and back stitch at the beginning and end of your line of sewing. Diagram b.

3. Seal the top and bottom edges of the eye tab by edge stitching along its very top and bottom edges. Again use a very small straight stitch, and back stitch at the beginning and end of your lines of stitching. Diagram c.

Note: If you wish, you could combine this step with the previous step, to produce one  - shaped line of stitching that both sews the front flap closed and seals the upper and lower edges.





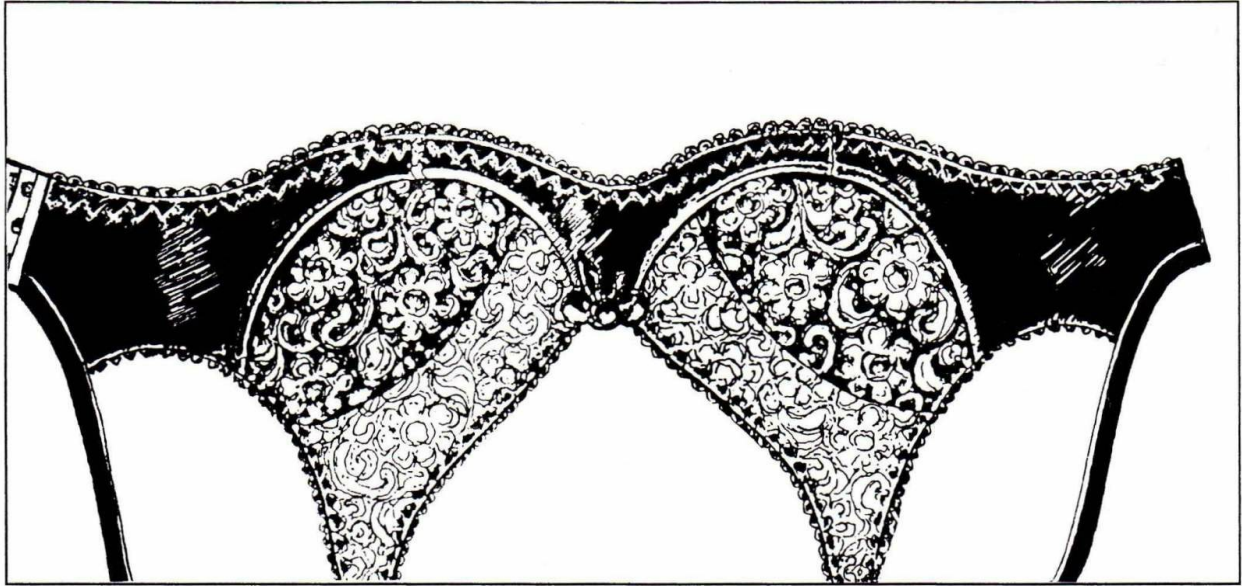
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## Sewing the Hook Tab to Your Bra

Spread your bra out in front of you, **right-side up**. Keeping the right side facing upwards, rotate it 180 degrees so that it is also **upside-down** Diagram below.

The hook tab will be sewn to the raw closure edge on your far right.

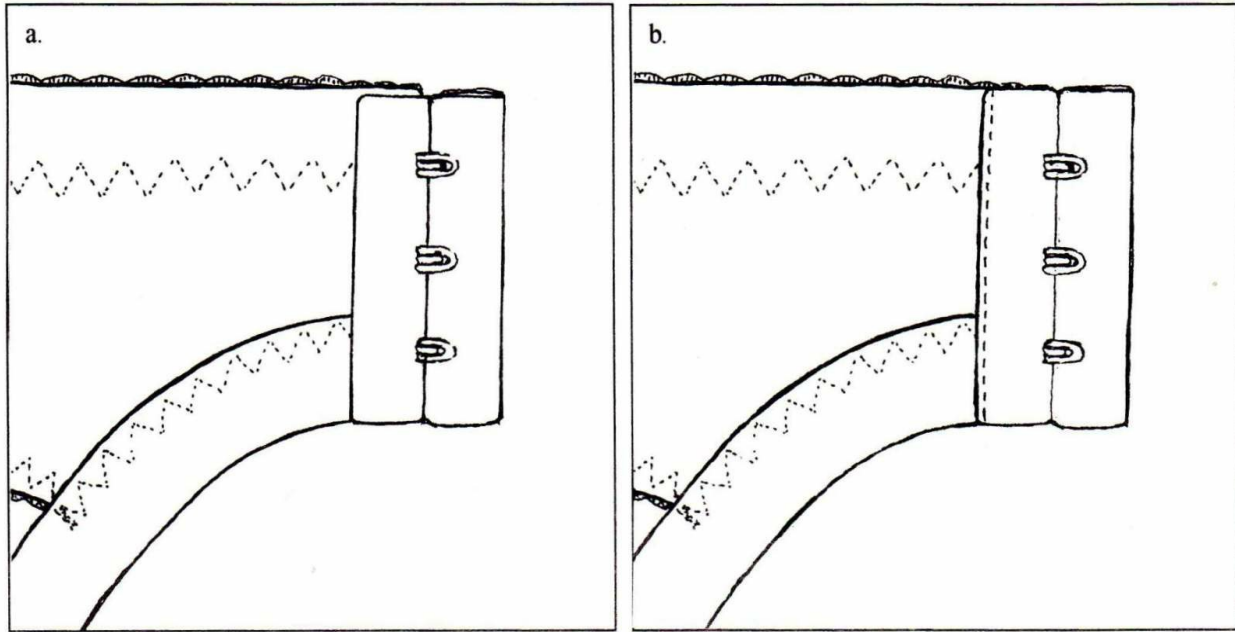
Whereas the eye tab had obvious flaps that opened and enclosed the raw edge at the centre back of the bra, the hook tab, when bought by the metre, is one flat piece of tape which has to be folded in half and wrapped around the raw edge of the fabric.



1. Keeping the bra in this position (right-side up and upside down), position the hook tab against its closure edge so that:

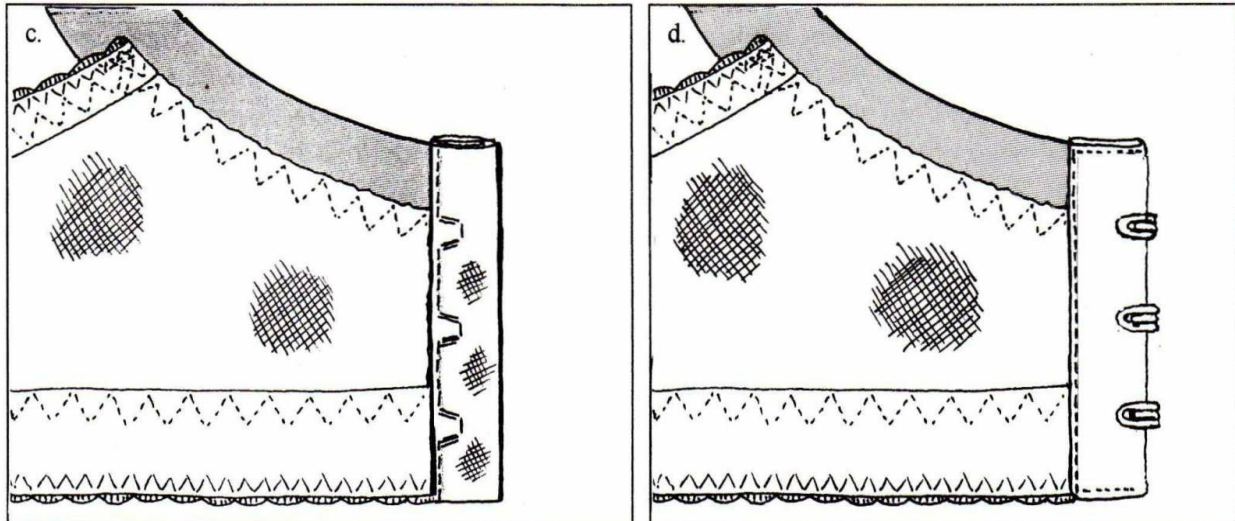
- the hooks are pointing away from the bra,
- the central seam on the tab is just past the raw centre back edge of the fabric, and
- the top and bottom edges of the tab are level with the finished edges of the bra back. Diagram a.

2. Using a very small straight stitch, and a backstitch at the beginning and end of your line of stitching, sew the tab to the bra back along the left-side edge of the hook tab. Diagram b.




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3. **Turn your bra completely over** so that the inside of this part of the garment is facing upwards. Diagram c.



4. **Fold the hook tab in half along its vertical mid line**, so that the overhang of the tab ends up being wrapped around the raw edge. To avoid the foot of your sewing machine hitting into the hooks, **either shift your needle's position to the far right, or attach a zipper foot** (the bulk of the presser foot needs to be to the left of the needle).

5. Using a very small straight stitch and a backstitch at the beginning and end of your line of sewing, ***sew the inside-garment flap of the tab to the bra back along its inner edge***. Diagram d.

***Seal the top and bottom edges of the hook tab by edge stitching along its very top and bottom edges***. Again, use a very small straight stitch, and a back stitch at the beginning and end of your lines of stitching. Note: If you wish, you could combine this step with the previous step, to produce one  - shaped line of stitching that both sews the inside-garment flap closed and seals the upper and lower edges of the hook tab

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## Dyeing Your Fabric and Bra Haberdashery

Because of the difficulty in obtaining bra fabrics and haberdashery in a variety of colours, the home sewer is generally limited to black, white, ivory and flesh when purchasing fabric. Sometimes bra kits are available in colours, but if we want to be independent, we can dye the fabrics and haberdashery ourselves into a wonderful range of colours that is limited only by our imagination.

- Always test-dye a small sample to determine whether or not your fabric or lace accepts the dye. Any special coatings on the fabric will interfere with dye absorption e.g. anti-static coating on nylon tricot. Fabrics or laces comprised of 100% polyester will not accept dye at household temperatures and a percentage of polyester in a fabric or lace will impede the depth of colour that is achieved.
- If I am dyeing large quantities, I either use very hot water in my washing machine (for pastels and medium shades) or an old electric 'copper' which keeps the water simmering (for rich and dark colours). If I am only dyeing small lengths, then an old saucepan on my cook top is sufficient. Because the elastic now manufactured contains synthetic rubber and is of a high quality, a once-off hot dye won't ruin elasticity in the way that it used to when natural rubber was commonly used in elastic.
- If I am dyeing a fair quantity of lace, elastic etc. I put each individual kind of lace or elastic loosely into a net lingerie washing bag. This prevents tangles.

- The lace, fabrics, elastics etc. to be dyed are then ***pre-washed in hot water in order to remove any sizing or other fabric finishes.***
- The dye is thoroughly dissolved in boiling water before it is added to the washing machine or copper (both powder and liquid dye should be dissolved in this way). Always add dye concentrate to the dye bath before adding the fabric. Never pour the concentrated dye onto fabric as this creates irregularities in colour.
- I use hot water dye. I use it in diluted strength for pastel colours and in a more concentrated solution for stronger and darker colours.
- I always add extra cooking salt to the dye solution. Salts help to 'set' the colour.
- ***Each individual type of fabric, lace, elastic etc. is dyed separately*** until it is just a fraction darker than desired, and then it is taken out of the dye and put into tub of rinse water. Each type of elastic or lace will absorb the dye at its own rate and this is why we can't just make a white bra and then dip it into dye. Some components of a bra accept dye very quickly and others accept the dye incredibly slowly.
- The fabric/haberdashery should be thoroughly agitated/stirred whilst in the dye solution. This will ensure an even coverage.
- Rinse the dyed material thoroughly, and when laundering the coloured bra, wash it separately so that if any excess dye bleeds out of your bra, it will not ruin other articles that have been inadvertently washed with it.
- ***When washing your coloured bras, only use a laundry powder or liquid that is specified as being safe for colours.*** These are the only types of detergents that do not contain strippers (strippers will strip the colour pigment from the fibres).

When dying, it is useful to know some colour theory basics. There are three primary colours: red, yellow and blue. Each primary can exist as a 'cool' or a 'hot' colour. Red can be a hot orange/red or a cool blue-red/crimson. Yellow can be a hot gold-yellow or a cool lemon yellow. Blue can be a hot, purple-blue or a cool green/blue. Adding black to a colour will just make the colour more greyish, not necessarily more dull, subtle or unusual. ***To dull a colour, add a tiny bit of its contrasting colour.***



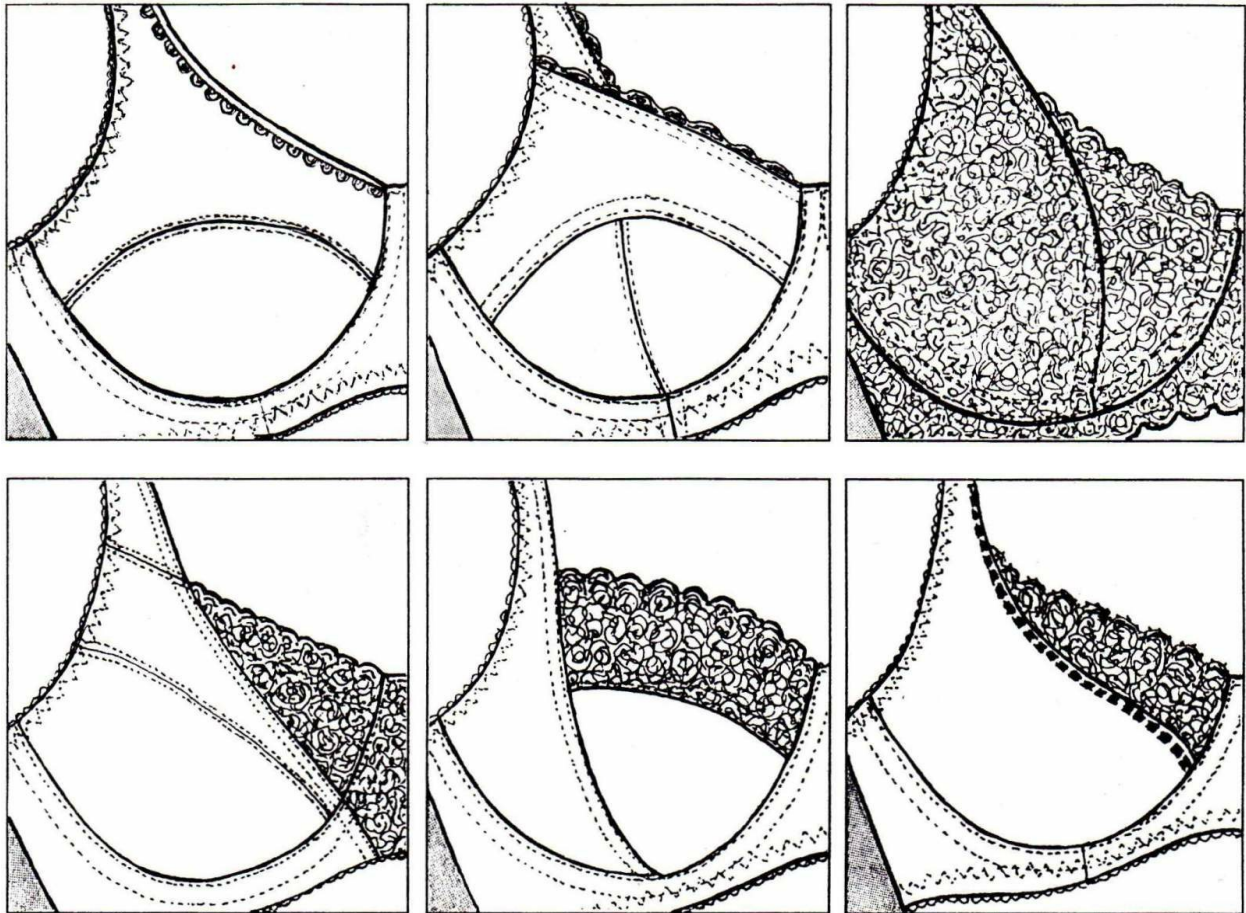
***There are three sets of contrasting or opposite colours:***

***Red and Green - Yellow and Purple - Blue and Orange***

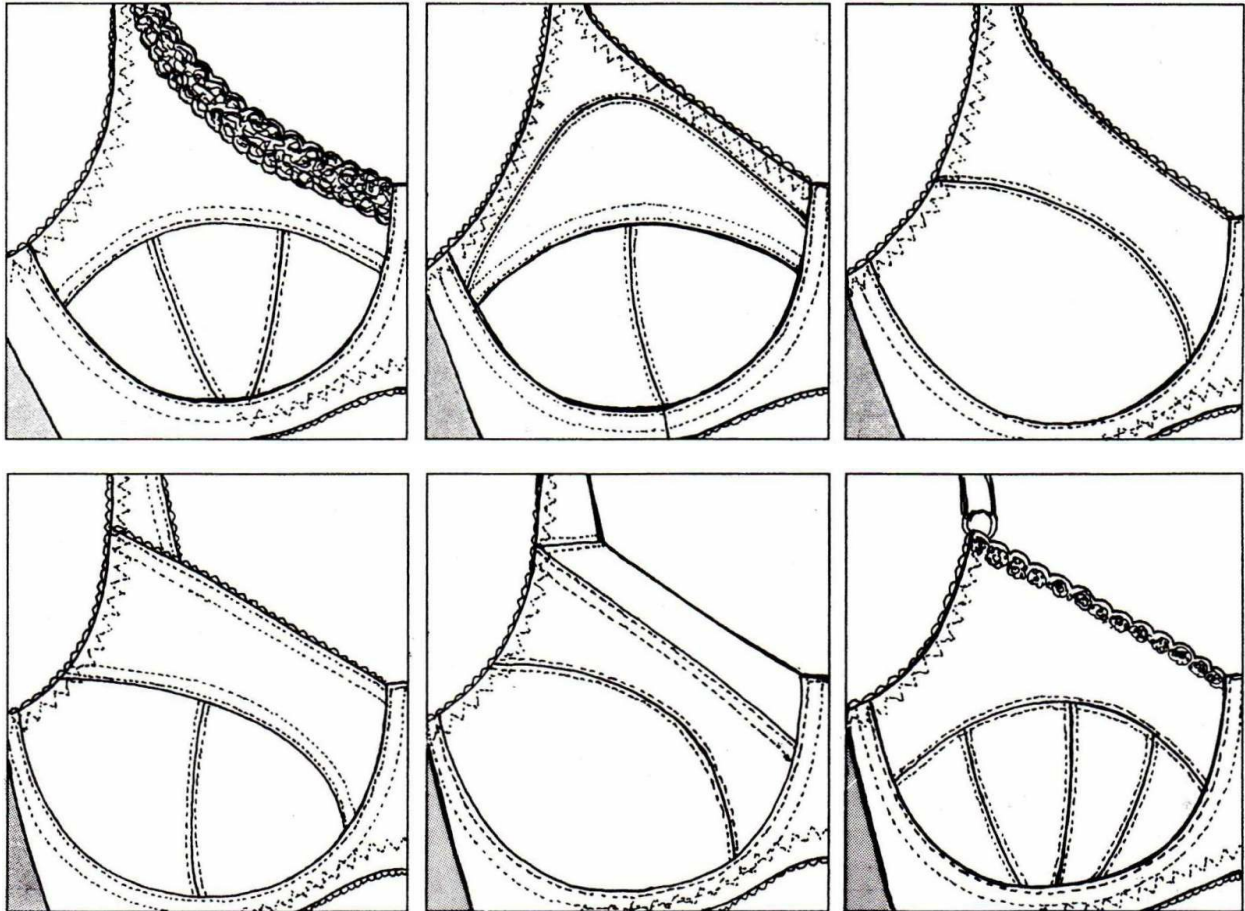
***If the colour you have in the dye is too bright or garish, then to make the colour duller and more subtle, add a tiny bit of its contrasting colour e.g. if you have too bright a bright purple, add a tiny bit of yellow. If you have too bright a yellow, add a tiny bit of purple etc.***

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### ***SOME UNDERWIRED BRA STYLES***





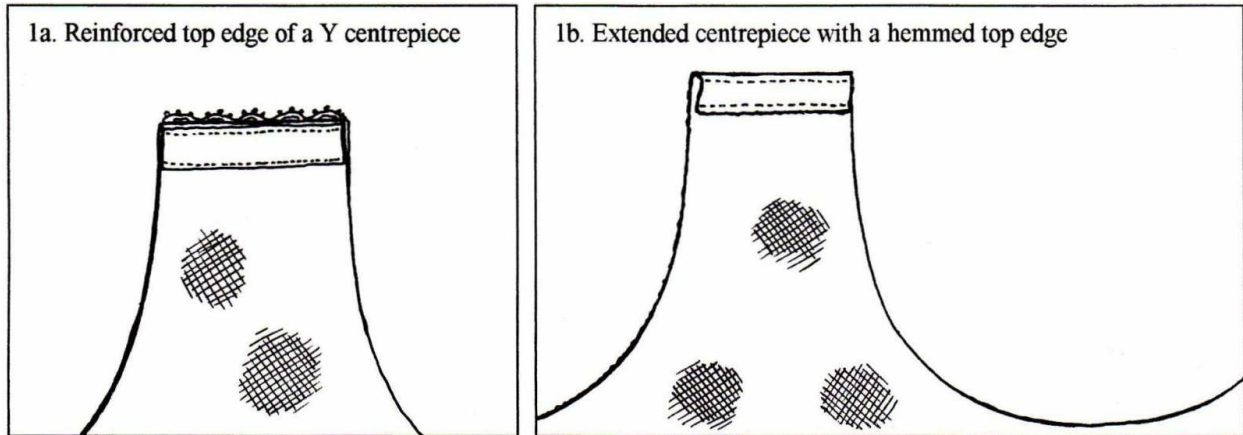


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## GENERAL SEWING INSTRUCTIONS

**GENERAL SEWING INSTRUCTIONS FOR A Y CENTREPIECE OR EXTENDED CENTREPIECE UNDERWIRED BRA** - Where the wire line seam raw edges are turned out of the cup

1. With a stretch needle in your machine, and using the **correct seam allowance, finish the top edge of the centrepiece in between the cup spaces**. This can be done using either a hem (turning the seam allowance over and stitching close to the cut edge) or if your fabric is quite thick, you may wish to simply reinforce the edge (trim off the seam allowance on the very top edge of the centrepiece and edge stitch cotton tape or bias binding to the inside of the raw edge, and fine edging lace to the outside of the raw edge).

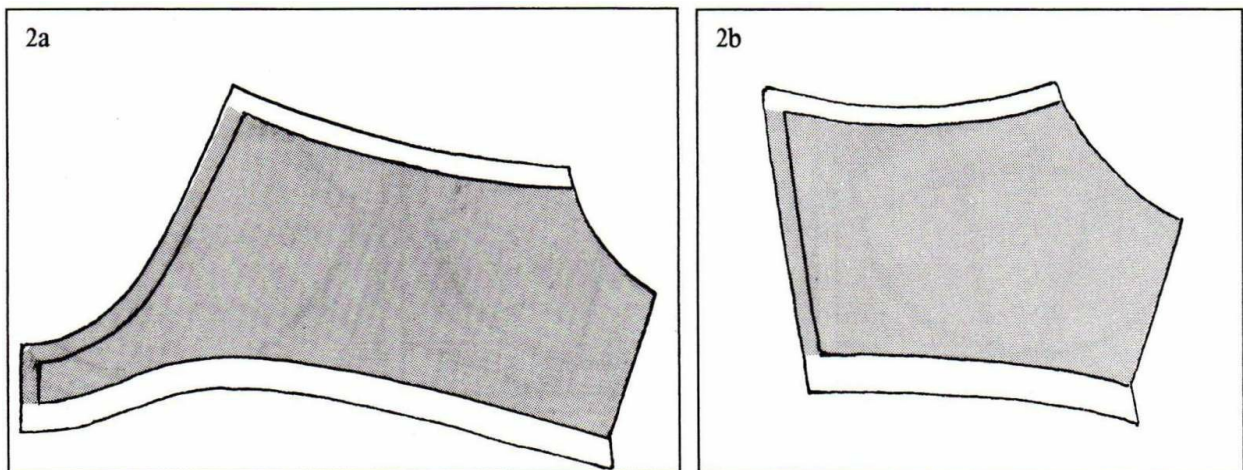


2. If your bra back is self-lined, stay stitch the two layers of each side of the bra back together, using a medium zig zag positioned very close to the raw edges.

If your bra back is a self-lined Y centrepiece regular style, it will be similar to diagram 2a.

If your bra back is a self-lined extended centrepiece regular style, it will be similar to diagram 2b.

Notice how the lining layer of the bra back only comes to the finished edge along the upper and lower edges of the bra back. The shaded area in these diagrams represents the lining layer of the bra back.



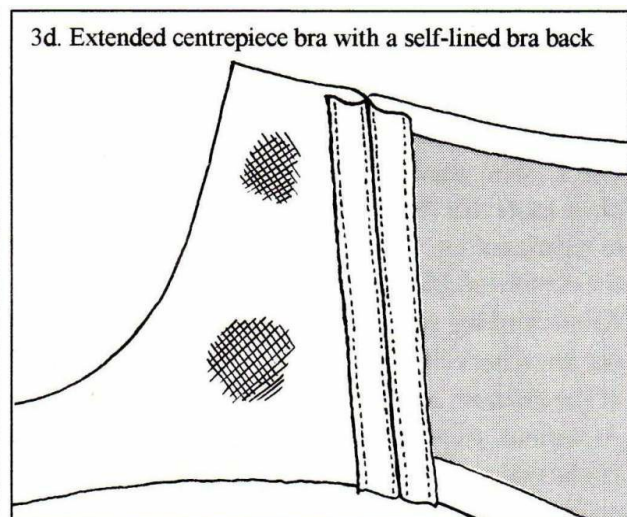
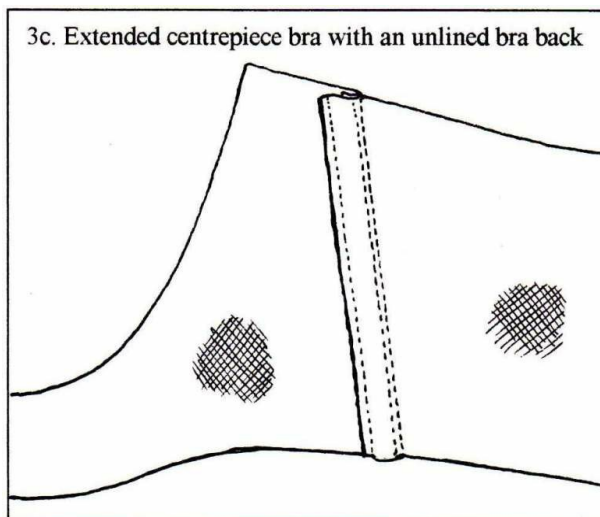
3. **Seam the centrepiece to the bra back** (right sides together) using an exact, **correct seam allowance** and a small straight stitch. If your bra is a Y centrepiece style with an unlined bra back, part the raw edges of this seam and top stitch them as shown. Diagram 3a. If your bra is a Y centrepiece style with a self-lined bra back, trim two thirds of the back-lining's raw edge away

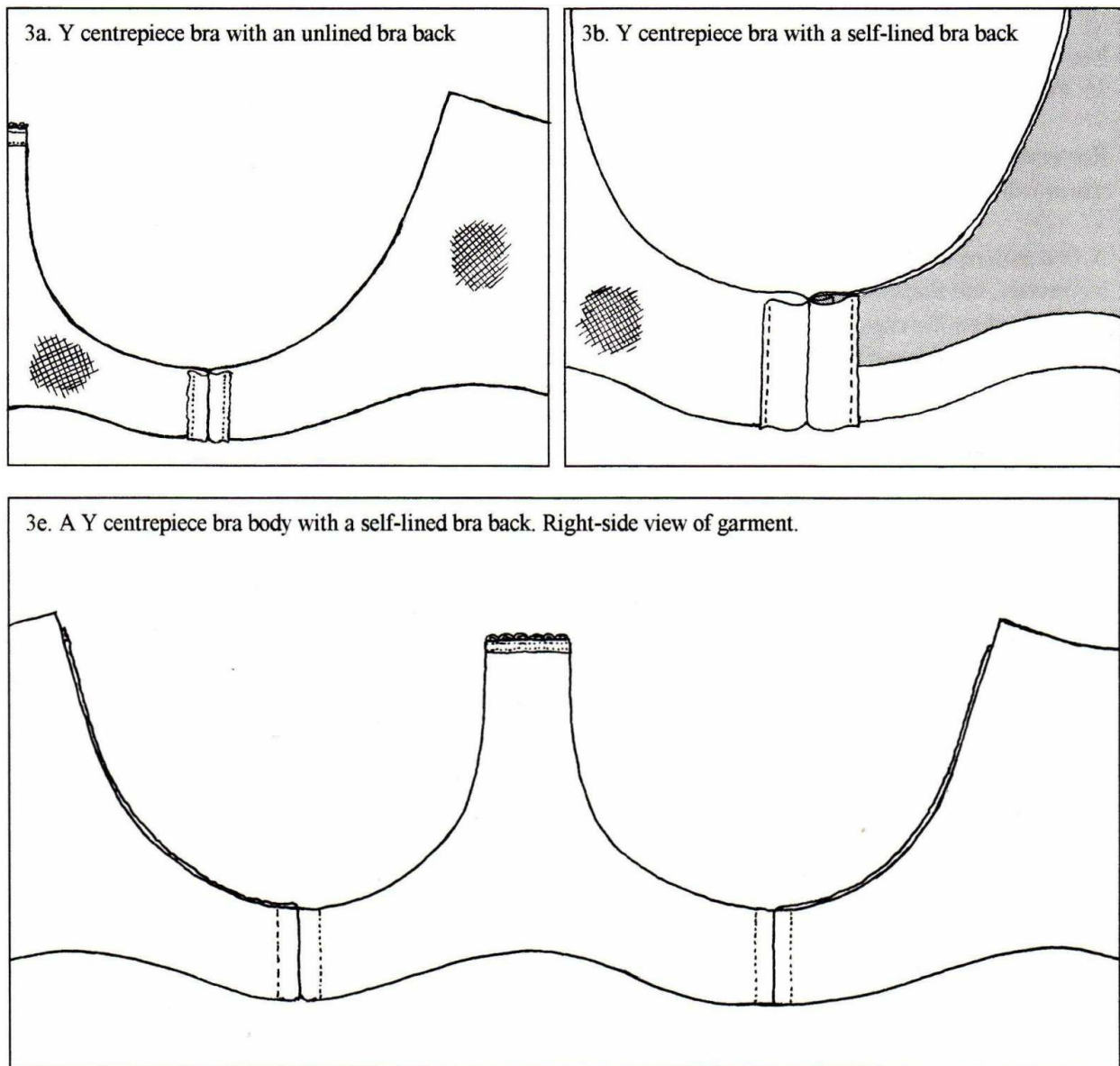
(it will become the enclosed raw edge), part the longer raw edges and top stitch them apart, positioning your stitches close to the raw edges. Diagram 3b. If your bra is an extended centrepiece style with an unlined bra back, trim back the raw edge belonging to the centrepiece, turn both raw edges towards the centre front and pin stitch and top stitch as shown. Diagram 3c.

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If your bra is an extended centrepiece style with a self-lined bra back, trim away two thirds of the back-lining's raw edge (it will become the enclosed raw edge), part the longer raw edges and top stitch them apart, positioning your stitches close to the raw edges. Diagram 3d.

The bra body is now assembled. If you have followed the above steps correctly, the overall shape of the bra body should contain two cup spaces, like the bra body in diagram 3e.





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#### 4. ***Assemble each cup and complete its neckline edge.***

Do not complete the armhole edge of each cup! The armhole edge is to be later finished off with the length of narrow scalloped elastic that will also finish off the top edge of the bra back. Simply sew each cup seam, top stitch and trim its raw edges and complete the neckline edge (according to the manner in which the neckline edge has been completed in your pattern bra, or using one of the methods on [pages 99](#) & [100](#)).

Remember to ***sew line(s) of easing stitch*** to the upper or lower cup seam



lines if required. Refer to [page 35](#). Pull the bobbin thread slightly taut to contract the central cup seam a fraction over the tip of the cup.

Remember to ***loosen the upper thread tension slightly when sewing your cup seams***, so that the cup seams not pull tightly, and refer to the information on [pages 89](#) and [90](#).

A bra pattern is very much like a jigsaw puzzle, and if the cup pieces especially, are joined together incorrectly, the shape of the cup will be adversely affected. As with all patterns, it is of vital importance to:

***correctly align the cup pieces***

***correctly align the main stretch/give in each cup piece*** (according to the arrows on the pattern) and

***sew the cup seams using a constantly accurate seam allowance.***

### ***Tips for Success***

To prevent major construction errors from occurring, I suggest that you strictly observe the following:

- ***Mark all directional letters and symbols on the right-fabric-side of the cut-out cup pieces.***

Use a fabric marking felt tipped pen to mark the notches, the centre, side and top of each cut-out fabric piece (note that this will only be possible if the colour of the fabric you are working with is light. If working in a dark colour, use liquid paper symbols placed within the seam allowances so that they won't show in the completed garment).

- ***Keep checking your cup pieces against the paper pattern pieces, to ensure that they correctly aligned in the bra*** (check that the top always faces northward, the word 'centre' always faces towards the centre front of the garment, and the word 'side' always faces towards the side seam).
- At various stages throughout the construction of the cups, ***always spread out the sections of the cups (right-side up) on the table in front of you***, as if the bra is finished and laid out before you. This way any major construction errors will be immediately apparent

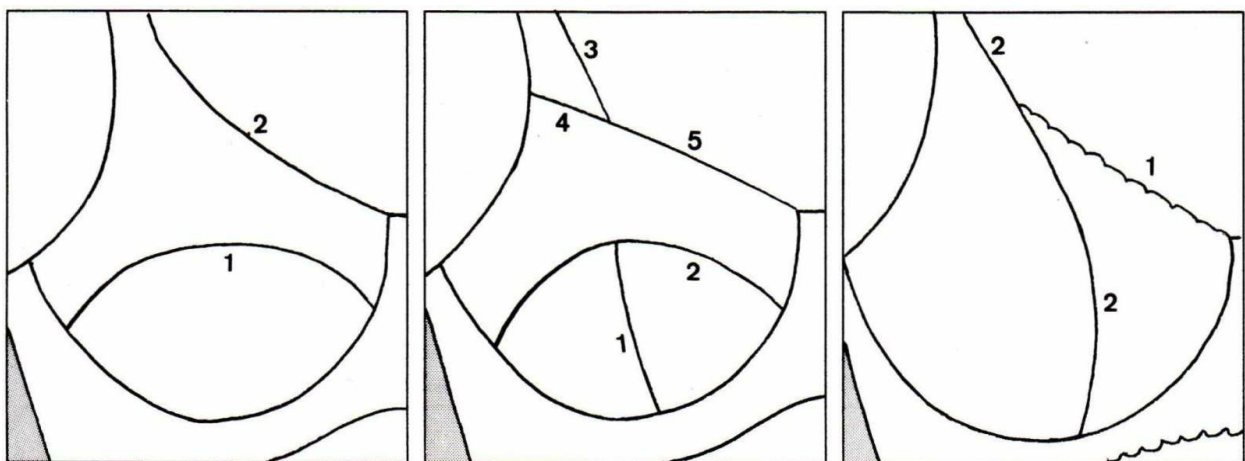
(e.g. if you have constructed two left breast cups).

Because each different style of bra cup has its own unique set of sewing instructions, it is impossible to provide a single set of sewing instructions that will apply to every type of cup. Some cups have a very simple style, with an upper cup and a lower cup with a single horizontal mid cup seam line. Other cups contain a number of cup pieces, and are very similar to a complicated jigsaw puzzle.

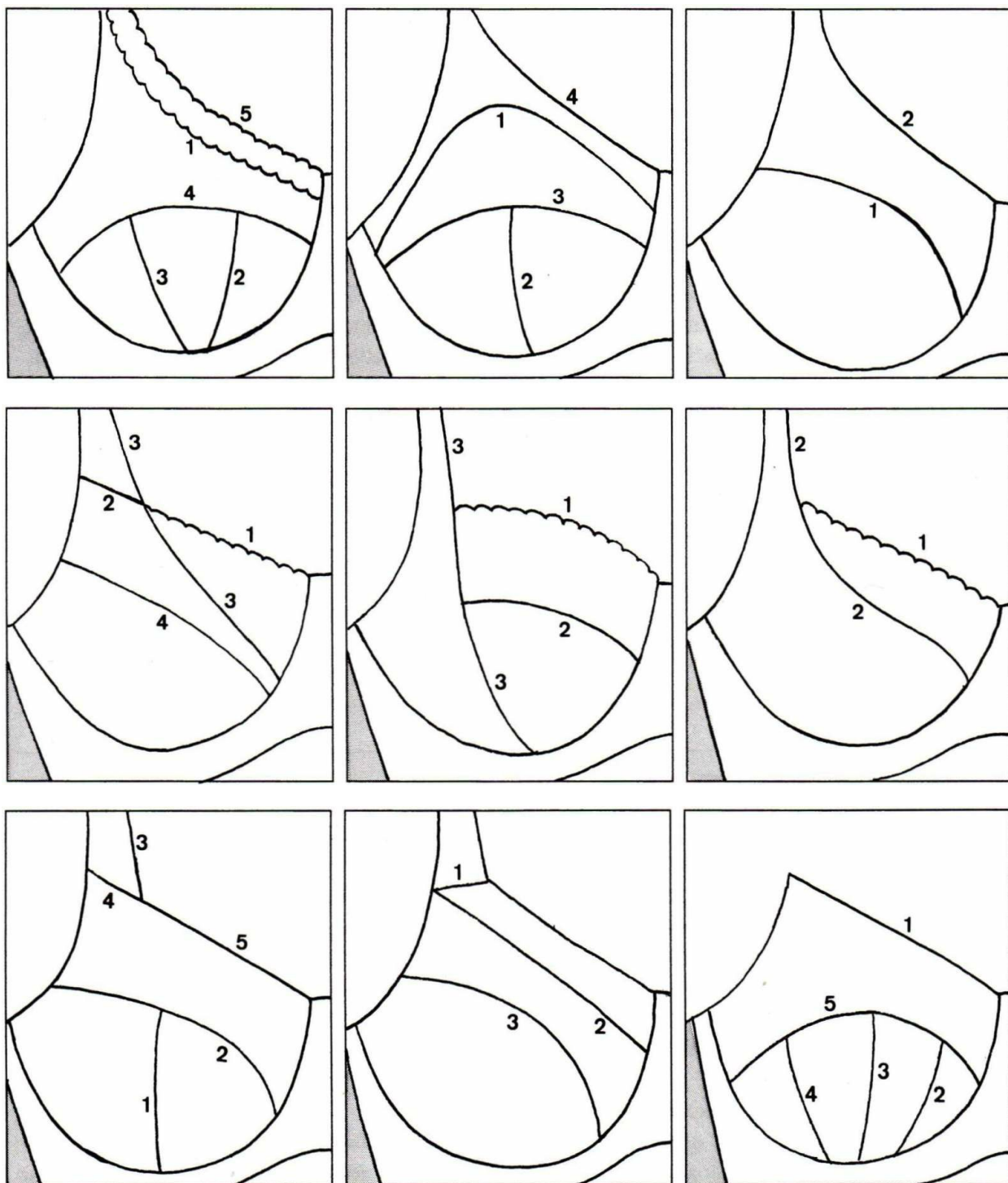
Look through the detailed sewing instructions for various underwired bras beginning on [page 147](#) and if your particular style of bra, or a style very similar to it is included, study the way the cup is assembled, and use the order of sewing as it applies.

Alternatively, ***the diagrams below show a selection of different cup styles with numbers indicating the order in which the cup seams are to be sewn and the neckline edge finished.*** The styles drawn opposite are those appearing on [page 113](#). If your cups have a side cup piece, the neckline edge of the inner cup section, (and also perhaps the neckline edge of the side cup section) will need to be completed before the side cup section and the inner cup section can be seamed together. The joining point at the neckline edge between the two sections is a stress point, and needs to be sewn securely so that the two parts of the cup don't tear apart. Diagram 4a.

[page 117]





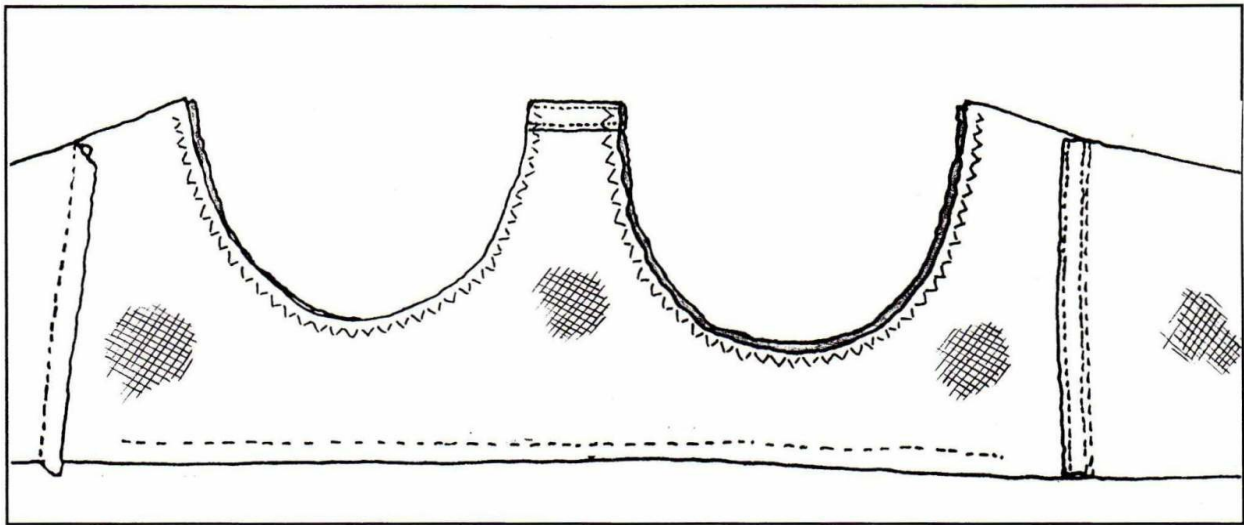


[page 118]

5. **Stay-stitch around the wire line of each cup** with a very long straight-stitch positioned exactly where the wire line seam will be (1cm in from the raw edge if your seam allowance is 1cm wide).

6. If your bra has an extended centrepiece that is made of two unbonded separate layers, then using a medium zig zag positioned very close to the raw edge, ***stay stitch the two layers of the centrepiece together around each cup space. Also stay stitch the two layers together across the bottom edge with a very long straight stitch.***

Note: To prevent the two layers from slipping against one another and puckering as you sew them together it is a good idea to use a walking foot on your sewing machine if you have one. A walking foot will feed the underneath fabric layer through at the same speed as the top fabric layer, thus keeping both layers of fabric exactly on top of each other, preventing slippage. A walking foot should be used whenever two separate pieces of fabric need to be sewn together so that they can be treated as one.



### ***7. Insert both cups into the bra body***

Pin the cups into the bra body and sew both wire line seams (the bra body being the centrepiece sewn onto the bra back). ***Do not top stitch or trim the raw edges of the wire line seam.*** The underwire casing will be later sewn to these raw edges.

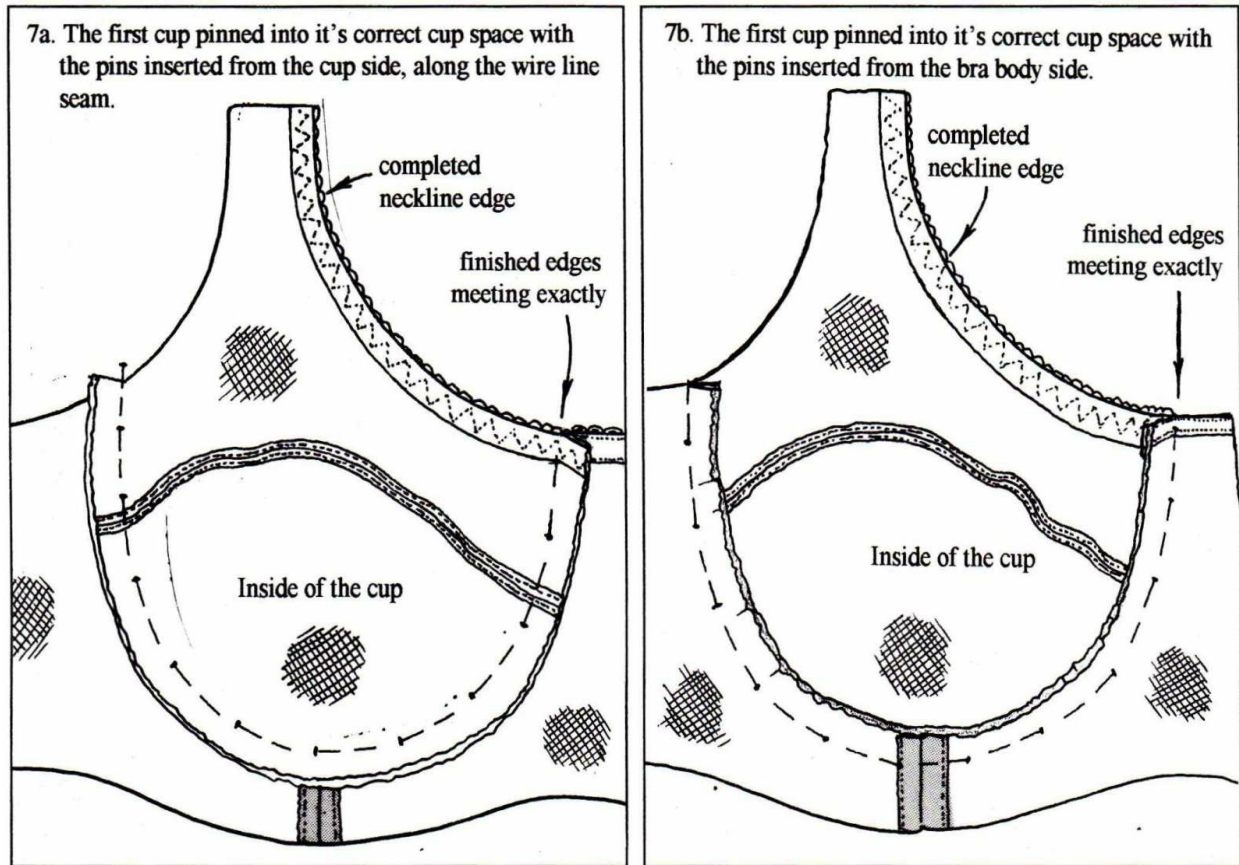
Inserting cups into a bra body is similar to inserting a sleeve head into an armhole space. You are joining a convex curve to a concave curve. It requires assertiveness, accuracy and manoeuvrability.

***The wire line of the bra body may need to be slightly stretched*** to accommodate the deep, rounded shape of the cup, so keep this in mind when inserting the pins. Always try to stretch the bra body a little, even

when it is made out of non-stretch fabric.

You will probably find it easier to ***insert the pins from the bra body side***, (doing this will mean that you will later sew the seams with the bra body facing upwards). Diagram 7b. That way, the fabric to be slightly stretched will be facing upwards, however if you are more comfortable inserting your pins, (and sewing the wire line seam) from the cup side, then it is a matter of personal choice. Diagram 7a. I suggest that you pin one cup into the bra body, and sew it in, and then do the same to the other cup. Sewing in one cup at a time will prevent being skewered by hundreds of pins as you sew each seam. If you insert your pins along the seam line, insert them exactly on the position of the seam line, as it is only on the seam line that the lengths of the two seams will be the same. ***Accurate pinning of these seams is important***, as a well-pinned seam will help to produce a well-sewn seam. Pin from the centre of the bra outwards towards the side of the bra, making sure that the finished centre front edges of the cup and centrepiece meet each other beautifully on the sewing line. When you have finished pinning the first cup into the bra body, turn your bra so that the right side of the garment is facing you. Does the edge of the upper cup exactly meet the top edge of the centrepiece? Have you pinned the cup into its correct cup space. Ask yourself, 'where is the raw armhole edge of this cup?' 'Where is its completed neckline edge?'

***Ensure that the raw edges of the cup and the bra body stay beautifully together.*** Unless you are careful, they will tend to slip apart. When stitching these seams, ***ensure that the seam allowance you are using is consistently accurate.***



8. **Sew unstretched wide scalloped elastic along the bottom edge of the bra** using the method of elastic application found on [page 97](#). Regardless of the width of the elastic you are using along the lower edge, when sewing the first line of stitching (the medium zig zag next to the scalloped edge) **make sure the elastic is positioned on the fabric so that when the elastic is turned upwards, it doesn't quite reach the wire line seam under the cups**. There should be just a fraction of clearance between the top straight edge elastic and the wire line seam. This small gap is vital, as the raw edges of the wire line seam have to be turned downwards over the elastic. The red area in diagram 9a highlights this important space.

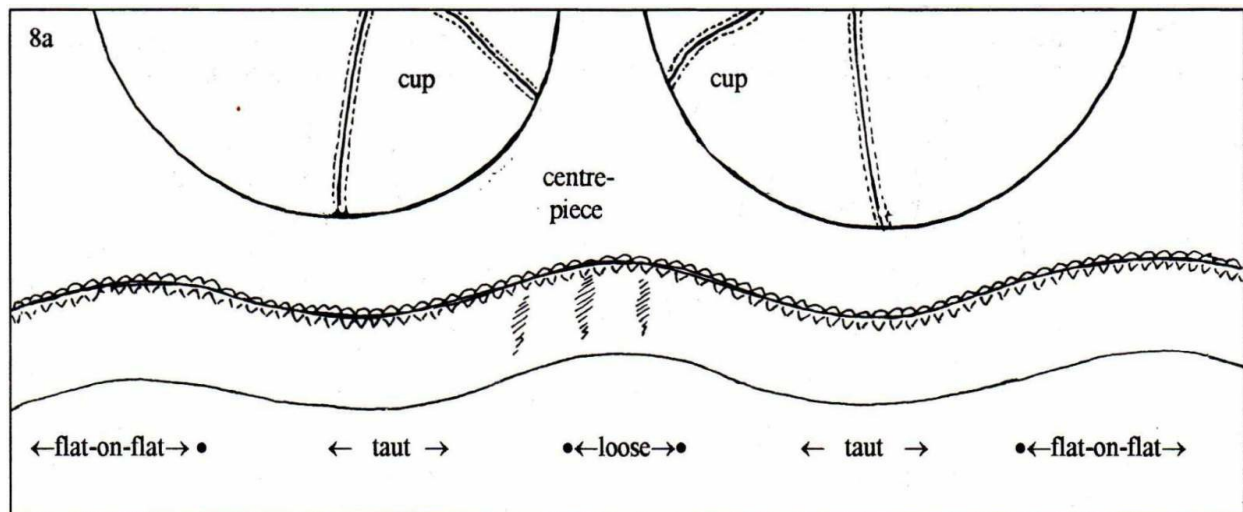
When elasticising this lower edge, a neater, more professional-looking result will be achieved if the following instructions are observed:

- When sewing the first line of stitching (the medium zig zags next to the scallops on the elastic) **pull the elastic just a fraction taut/firm in the area underneath each cup and loosen it right off at the centre front where the lower edge arches upwards**. Diagram 8a.

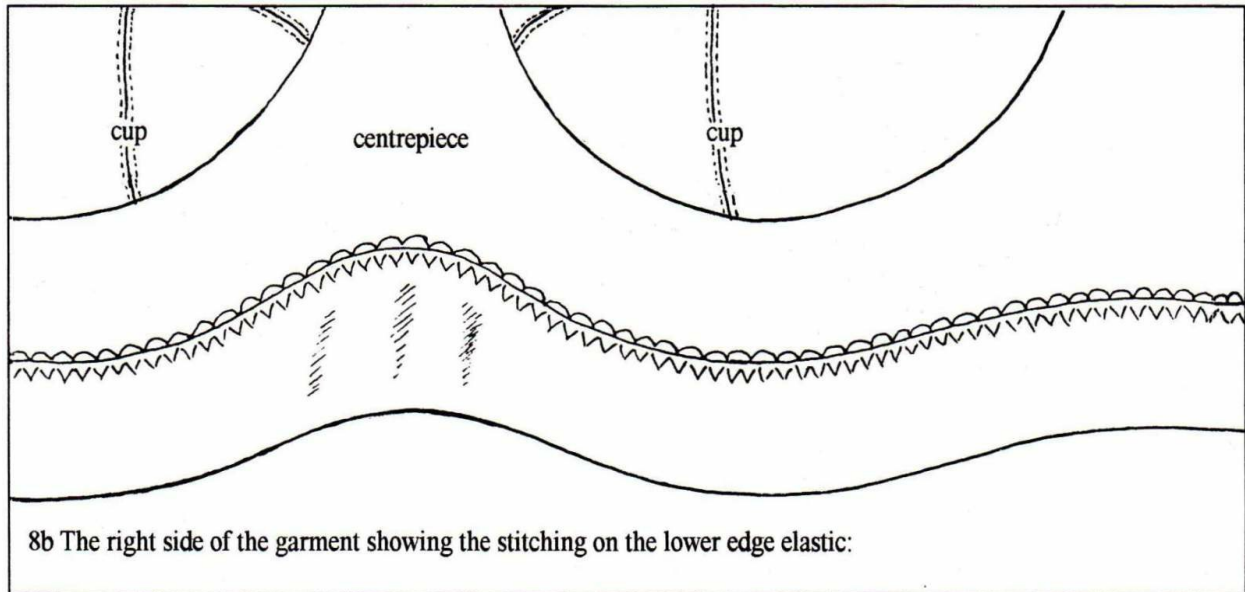
This allows for the way the elastic has to turn upwards into a slightly smaller curve under the cups, and has to turn upwards out onto a longer-lengthened curve at the centre front. Manoeuvring the elastic like this will prevent puckering of excess elastic under each cup, and it will allow the lower centre front edge of the centrepiece to sit flat. Along the lower edge of the bra back, the elastic should be sewn unstretched, flat-on-flat.

- After you have sewn the first line of stitching (the medium zig zags next to the scalloped edge), using a small straight stitch, sew a line of stitching right at the base of the scallops of the elastic, across the front of the bra (from under the side of one cup to the side of the other cup). Diagram 8b. Doing this will produce a crisp lower edge across the non-stretch front of the bra, preventing the points of the zig zags from being exposed when the elastic is turned upwards.

[page 120]





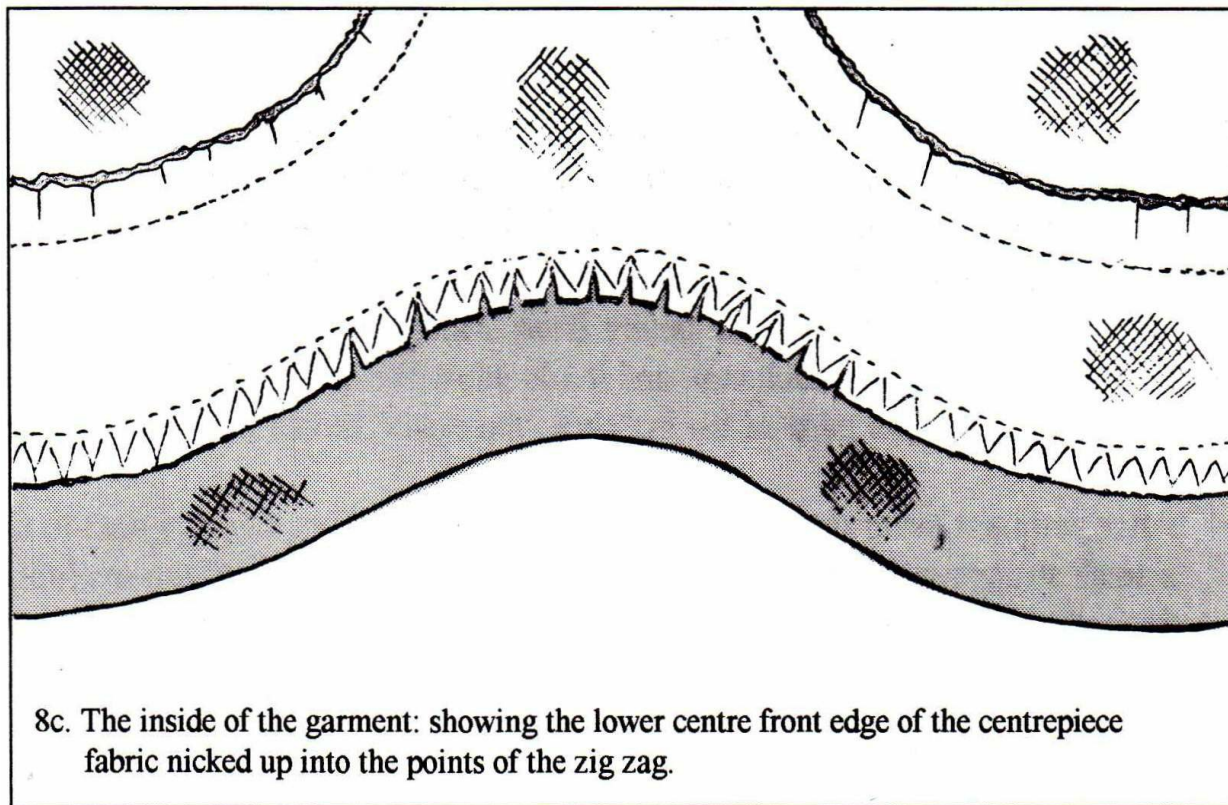


- After trimming back the fabric to the line of medium zig zags, and before turning the elastic upwards to be top stitched with a large three-step zig zag, ***clip through the raw edges of the centrepiece fabric, upwards into the points of the zig zags at the centre front section of the bra's lower edge.***

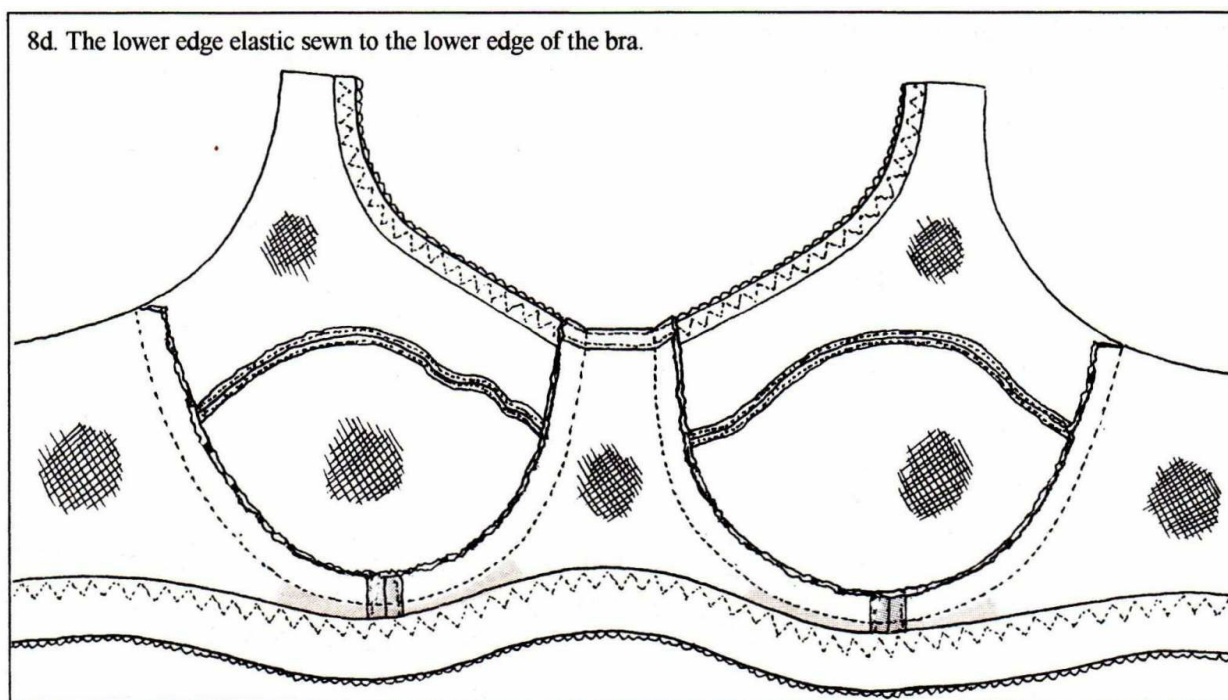
Diagram 8c. Be careful not to accidentally cut the stitching.

Doing this will further allow the lower edge in between the cups to sit flat.





[page 121]

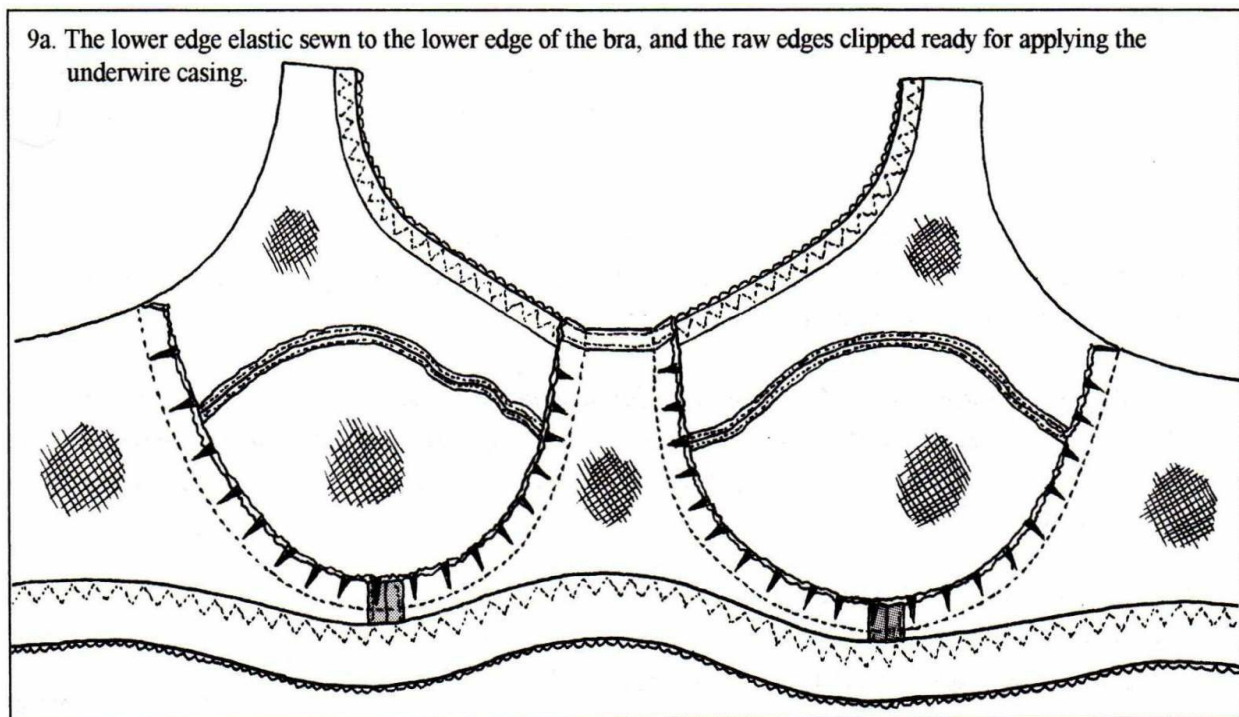


**9. Sew the underwire casing to the wire line seam's raw edges.**

Before working your way through these detailed instructions, read [pages 82-85](#).

To prepare your bra for applying the underwire casing:

**Clip through the raw edges belonging to the bra body** all the way around each cup space at close intervals Diagram 9a. The cuts/nicks should almost (not quite) reach the wire line seam.



To reiterate, all the raw edges around the edge of the cup must be folded **out of the cup**.

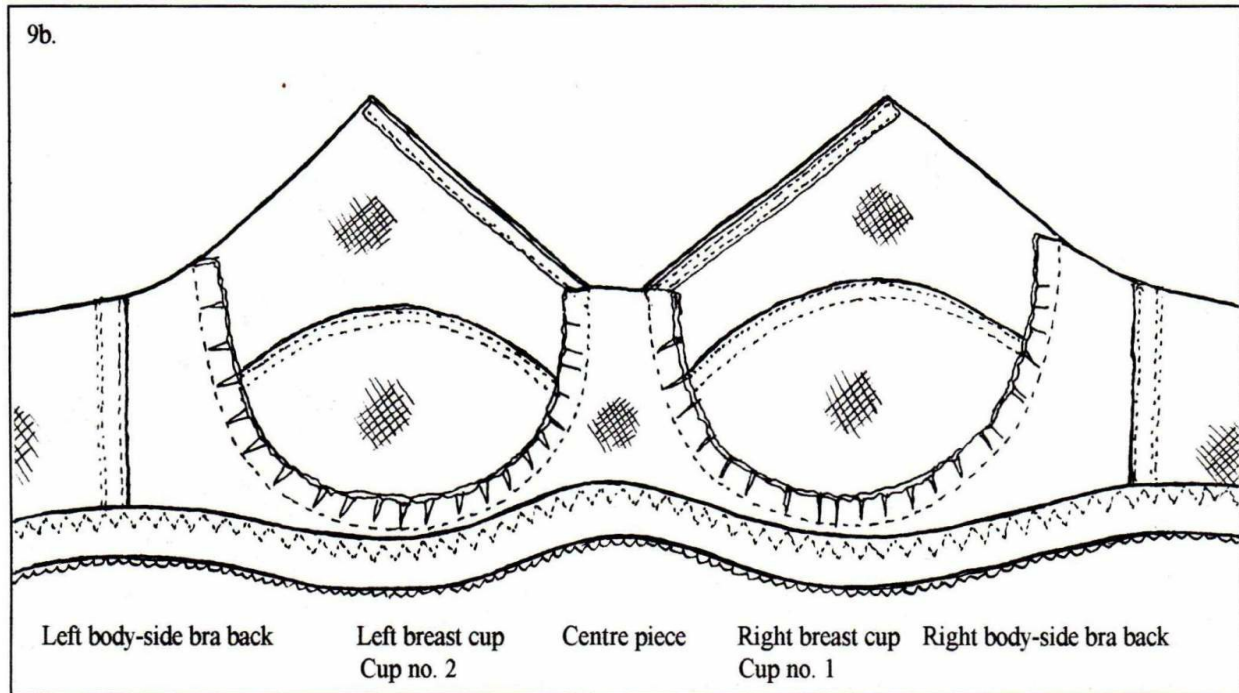
The underwire casing is to be sewn to these raw edges so that when they are all folded out of the cup, the underwire casing completely covers the raw edges.

**\*\*\*\*\* The casing therefore has to be stitched to the cup-side surface of the raw edges.**

**To isolate the raw edges of a cup** so that the casing can be sewn to them (sewn to the raw edges alone) work through the following instructions:

[page 122]

Place the bra with the **inside-surface facing upwards** in front of you.



You are going to sew the underwire casing to the right breast cup first (we will call it cup number 1).

So that you can sew the casing to the raw edges alone, it is necessary to **isolate the wire line seam's raw edges** where cup number 1 is sewn to the bra body.

**Keeping the inside surface of the right breast cup facing upwards, fold all the bra body and the other cup (the rest of the bra) underneath cup number 1.** The only parts of the bra on the right of the wire line seam are the raw edges. The outer surface of the centrepiece and bra back fabric is now lying against the outer cup fabric of the right breast cup. All that can be seen now is the inside surface of cup number 1 and the cup-side surface of the wire line seam raw edges.

Lay a length of underwire casing on cup number 1's wire line seam raw edges so that:

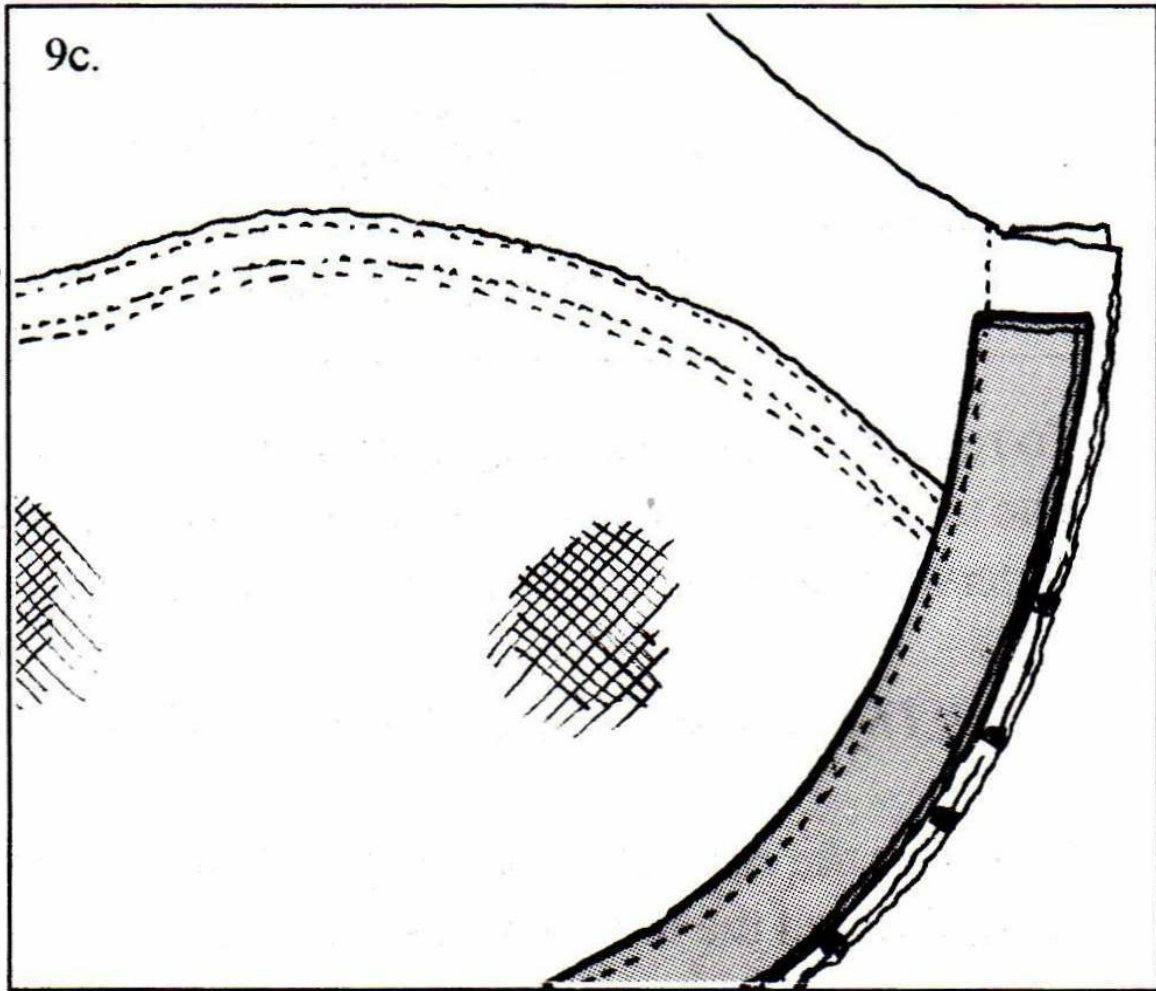
- the width of the casing is sitting on the seam allowance ... **all of the casing should be to the right of the seam that joins the cup to the rest of the bra.**
- **the end of the casing is 1cm below the raw fabric underarm edge** of the bra (so that when narrow scalloped elastic is later applied to the

total underarm edge, the elastic and fabric can be folded down neatly over the edge of the casing, preventing the needle-breaking excessive bulk should the casing itself have to be folded back onto itself).

- ***the stitching on the left side edge of the casing is placed directly over the seam.***

This placement of the underwire casing should be 'sighted' Pinning the underwire casing to the bra, doesn't increase accuracy or produce a neater result. To increase accuracy and control as you sew the underwire casing to the bra, have your sewing machine positioned close enough to your body so that your back is straight, not stooped over, and have the sewing machine needle aligned with the centre front line of your body. If your sewing machine has a 'needle-down' position, utilising this capability will also increase your control helping produce a neater finish. The correct placement of the casing is shown below.





[page 123]

Using a **sharp needle** on your sewing machine and a **medium straight stitch**, stitch along the left side of the underwire casing, following the line of stitches already on the casing, very close to its left-hand edge. Your line of stitching will also be positioned as closely as possible: **directly on top of the wire line seam** (the seam that joins the cup to the rest of the bra).

**As you sew, slightly stretch the wire line seam, and the raw edges under the casing.** Slightly stretching the raw edges as you sew the casing to them, will produce a slightly longer length of casing that is sewn to the raw edges, making it easier to later fold the casing completely out of the cup (onto a greater curved area). This gentle stretching should not be overdone: it is only a **slight stretching, that should be done mainly on the very curved sections of the wire line seam ... from the top centre front edge around to**

***where the seam straightens out 1/2 way up the side of the cup.***

***Keep folding the bra body under the cup all the way around, so that the raw edges continue to be isolated and nothing but the raw edges are to the right of the wire line seam.***

***When you come to the top neckline edge of the cup at the centre front of the bra, leave a casing overhang of at least 1cm.*** This overhang will ensure that the casing can later be neatly trimmed off flush with the top neckline edge of the centrepiece (at an angle if necessary).

To prepare the bra in order to sew the casing to cup number 2's raw edges, lay the bra out again in front of you, inside surface facing upwards.

You are now going to sew the underwire casing to the left breast cup's raw edges (cup number 2).

So that you can sew the casing to the raw edges it is necessary to ***isolate this cup's raw edges*** in exactly the same way as done with cup number 1.

***Keeping the inside surface of the left breast cup facing upwards, fold all the bra body and the other cup (the rest of the bra) underneath cup number 2.*** The only parts of the bra on the right of the wire line seam are the raw edges. The outer surface of the centrepiece and bra back fabric is now lying against the outer cup fabric of the right breast cup. All that can be seen now is the inside surface of cup number 2 and the cup-side surface of the wire line seam raw edges.

Lay the casing on the seam allowance, again ***leaving a casing overhang at the centre front of at least 1cm.*** Stitch along the left side edge of the casing as before, ***making sure that your stitches are on top of the wire line seam,*** and that you continue to ***slightly stretch the wire line raw edges of the cup*** as you sew the casing to them.

***Keep folding the rest of the bra underneath the cup that you are working on*** so that the only fabric to the right of the wire line seam is the wire line seam raw edges.

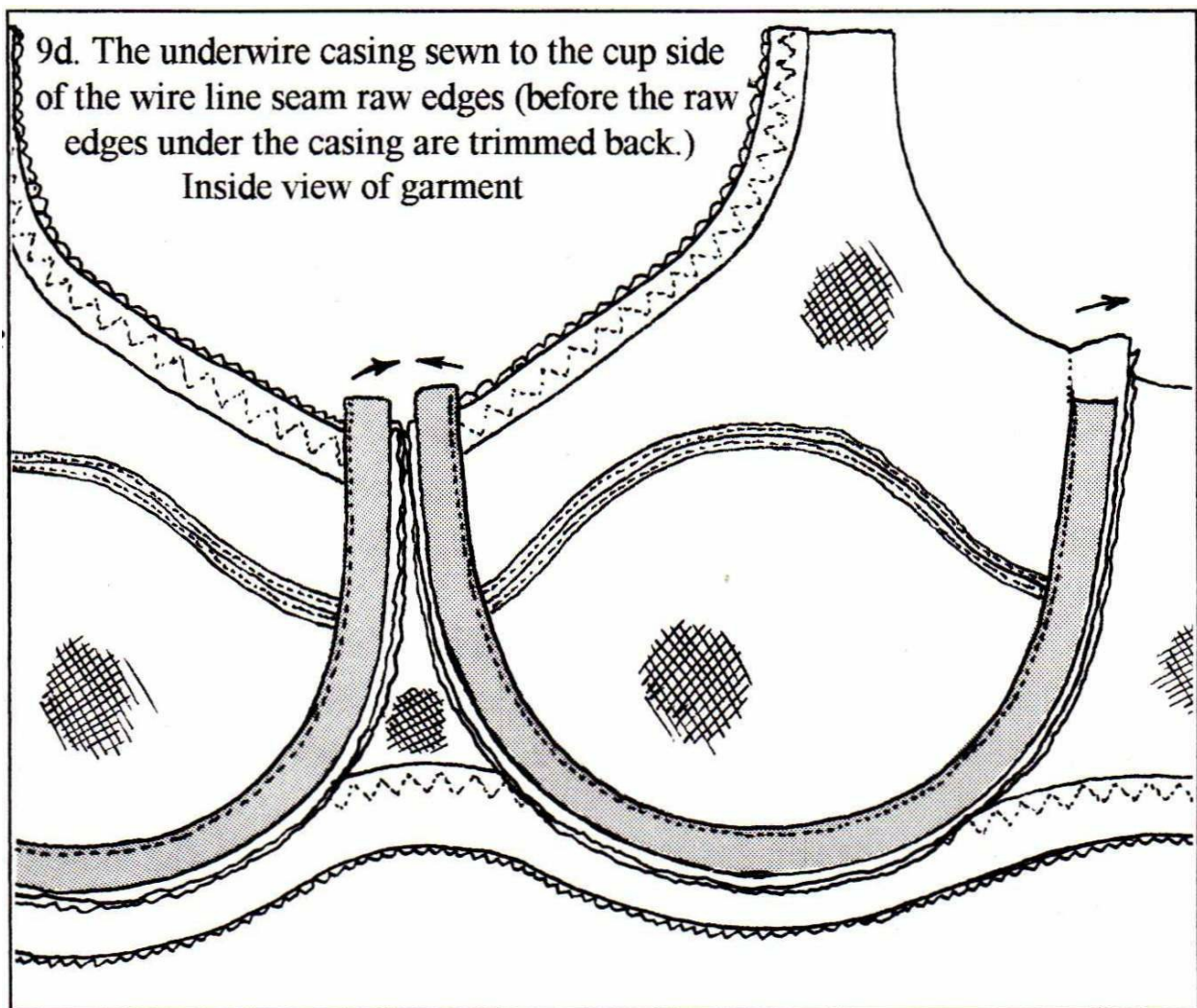
***When you are approaching the underarm raw edge, stop sewing 1cm below the raw fabric edge.***

Diagram 9d.

Cut the casing neatly where your stitching ends, cutting the casing off at the same angle as the raw edge. Diagram 9d.



Now that the underwire casing is sewn to the raw edges of both cups, **trim back all the wire line seam's raw edges.**



[page 124]

10. **Sew the pin-stitching, sewing from the right side of the garment** (pin-stitching is top stitching that is positioned a pin-width away from the seam line/edge). The purpose of this pin-stitching is to make sure that **the casing is frilly folded out of the cup**, and to give the bra a tight, professional garment finish.

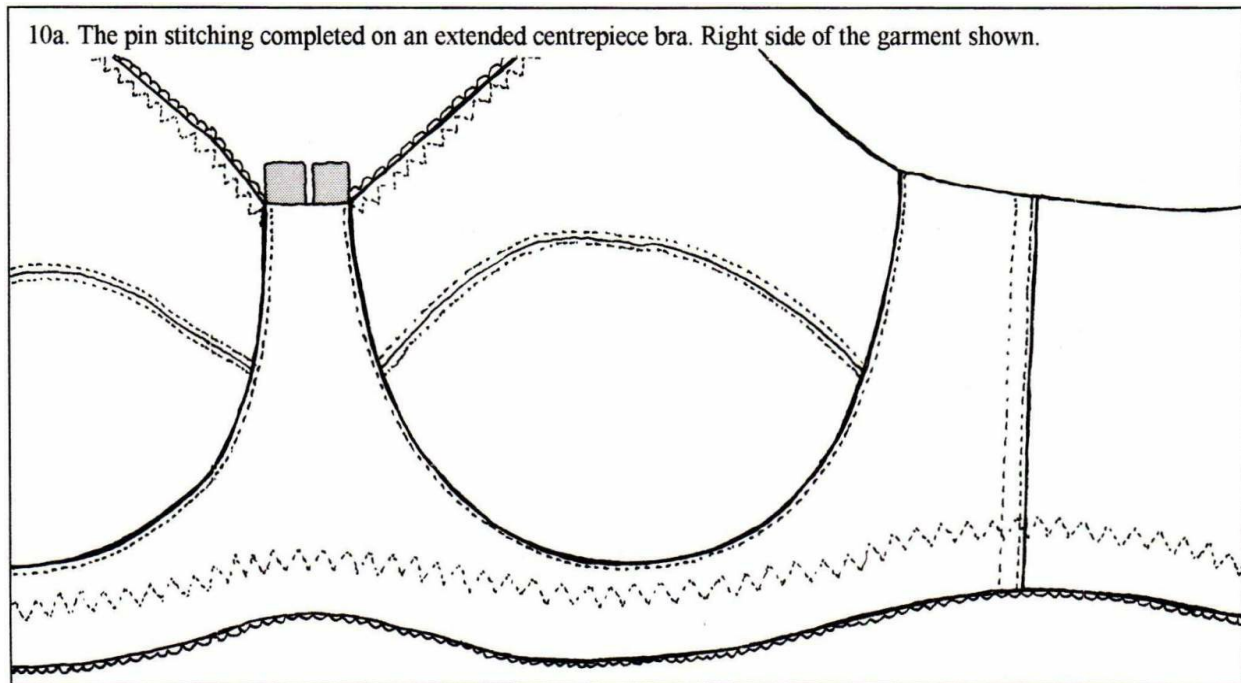
Lay the bra out in front of you, **right-side up**. Turn the both lengths of underwire casing completely out of the cups. It is important that the casing not be allowed to encroach back into the cup, especially in the area

underneath each cup. Note: ***When pin-stitching, do not excessively pull the bra body away from the cup, as doing this will allow the casing to stray over into the cup space***, causing later problems.

Beginning with cup number 2 (the left breast cup which will now lie to your right), sew a line of medium length straight stitches (the pin-stitching) ***just outside the wire line seam*** as shown in diagram 10a.

Notice that the pin-stitching will lie just outside of the cup itself, and will be sewn onto centrepiece/bra back fabric.

***As you sew the pin-stitching, make sure that there is absolutely no part of the casing lying to the left of the wire line seam (straying over into the cup-space).*** Your left-hand's fingernails should be able to press right up to the wire line seam without feeling the bulk of any underwire casing on the underside of your garment. Ensuring that the casing is fully turned out of the cup like this is vital to the success.



In a similar way, sew the pin-stitching around cup number 1, making sure that the casing is folded completely out of the cup. Begin at the top of the centrepiece's centre front edge and sew around to the underarm edge of the cup.

**11. Sew the outer top stitching to both lengths of casing, sewing from the**

***inside of the garment.*** Turn the bra over so that the inside surface of the garment is facing upwards, and sew a line of medium length straight stitches along the outside edge of the casing (the other edge of the casing that is farthest away from the cups).

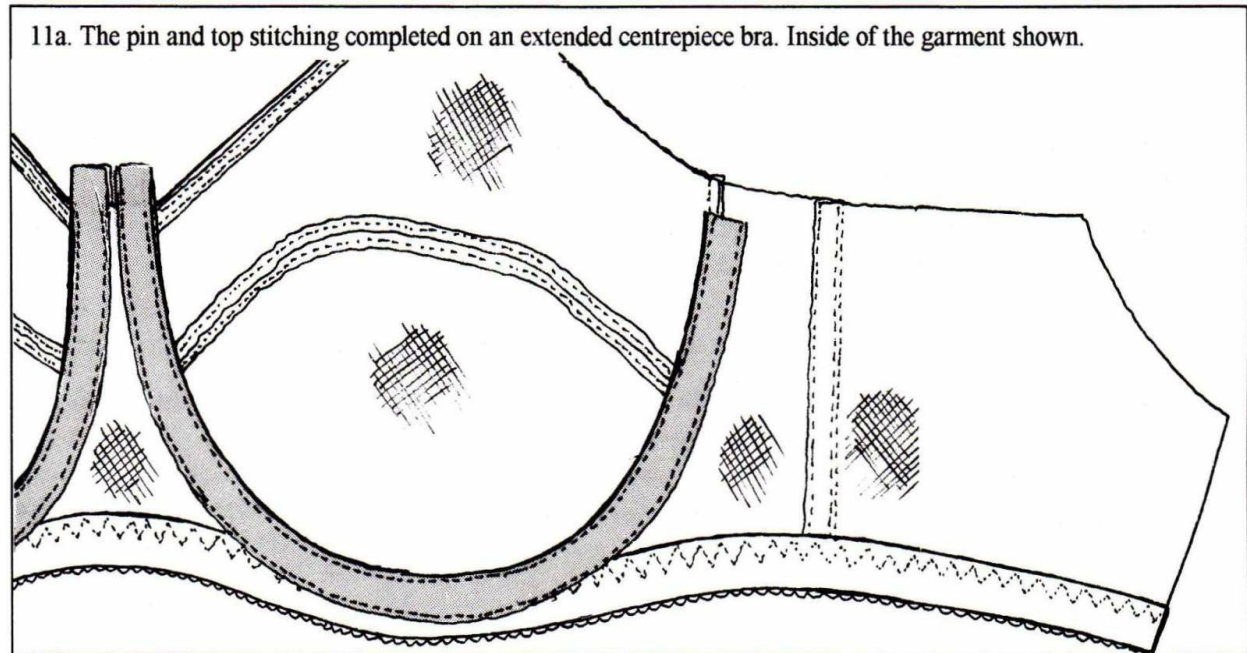
If the casing you are using is double-stitched, follow the line of stitching already on the casing).

When sewing this line of top stitching, ensure that the central channel of the casing is not going to be significantly narrowed at any point along the length of the casing, as the wire will have to be inserted through it.

The more practice you get at applying underwire casing, the more the pin-stitching and top stitching will be beautifully parallel.

[page 125]

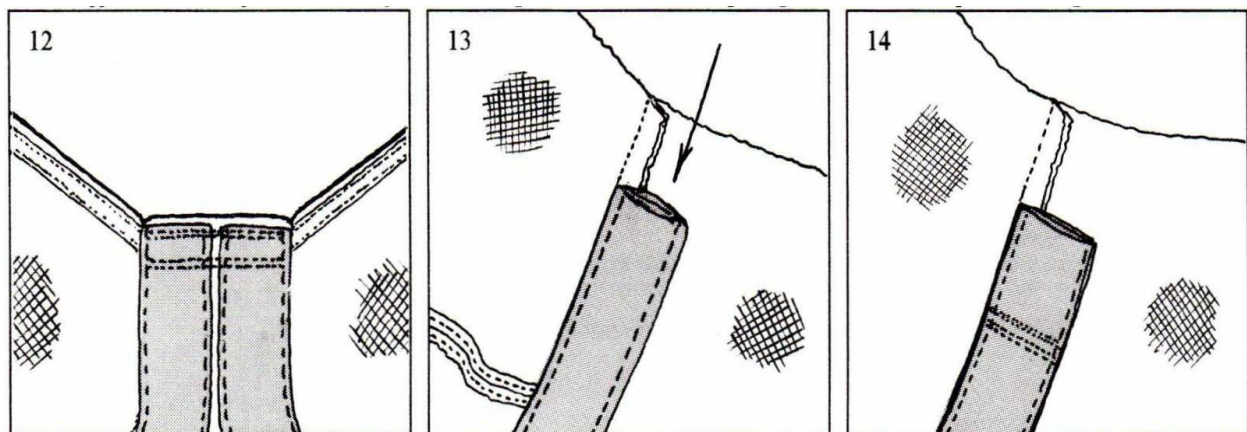
\* Once you have sewn a few bras and your confidence has developed, you may wish to sew this line of top stitching from the right side of the bra instead of from the inside. Shifting your needle position slightly to the right and using the edge of the presser foot as a guide will ensure that the top stitching runs parallel to the line of pin-stitching, producing a very professional finish to your Remember to use a medium to long stitch length when gaining practice at applying underwire casing so that if your lines of stitching run crookedly, or they run off the casing altogether, you can easily unpick them.



12. **Seal off the top centre front end of the casing** by sewing two lines of very tiny straight stitches, back and forwards, positioned parallel to the top edge of the centrepiece as shown below.

If your sewing machine finds it difficult to cope with sewing through thicknesses, don't try reversing back over the thicknesses, but leave the needle down, lift the presser foot and turn your work around so that your sewing machine is always travelling forwards.

**Trim off the centre front ends of the casing**, level with the top edge of the centrepiece. Diagram 12.



13. **Insert each wire into the open central channel of the casing in the underarm area** (centre tip first) having a few more layers within the casing

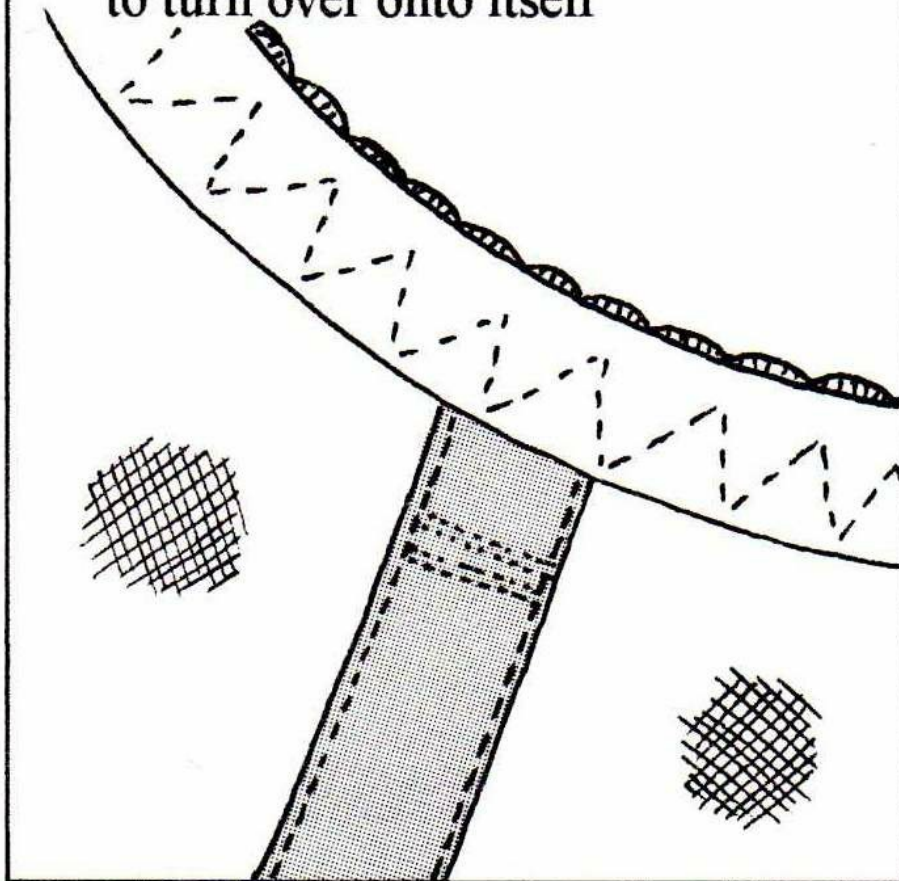
itself between the wire tips and the inside of the garment than there are between the wire tips and the outside of the garment. Diagram 13.

Doing this will take into consideration the thicknesses of the outer fabric, and better cushion the tip against the skin when the bra is worn. ***This will help prevent the wire tips from penetrating the casing and coming through on the inside of the bra.***

14. Now that the wires are in the bra, ***seal across the channel of the casing just above the side tips of the underwires*** using a line of tiny straight stitches sewn back and forth and back again. Position your line of stitches as close as possible to the side tip, by either using a zipper foot or moving your needle position to the far left. Diagram 14. Sealing off the casing channel above the side tip of the wire like this will reduce the side-to-side movement of the wire within the casing and thus reduce the 'wear and tear' on the casing itself, prolonging garment life.



14 In both bra styles the underarm edge elastic, is folded neatly over the underarm end of the casing. Because the casing was cut off 1cm below the raw underarm edge, the casing should not have to turn over onto itself



[page 126]

15. Change your sewing machine needle back to **a Stretch needle**. **Elasticise the entire underarm edge, stretching the edging elastic just a little at the side of the upper cup to eliminate gaping.**

When starting the first row of stitching at the top of the cup, be aware that the finished width of the top point will have to pass through a ring, if the

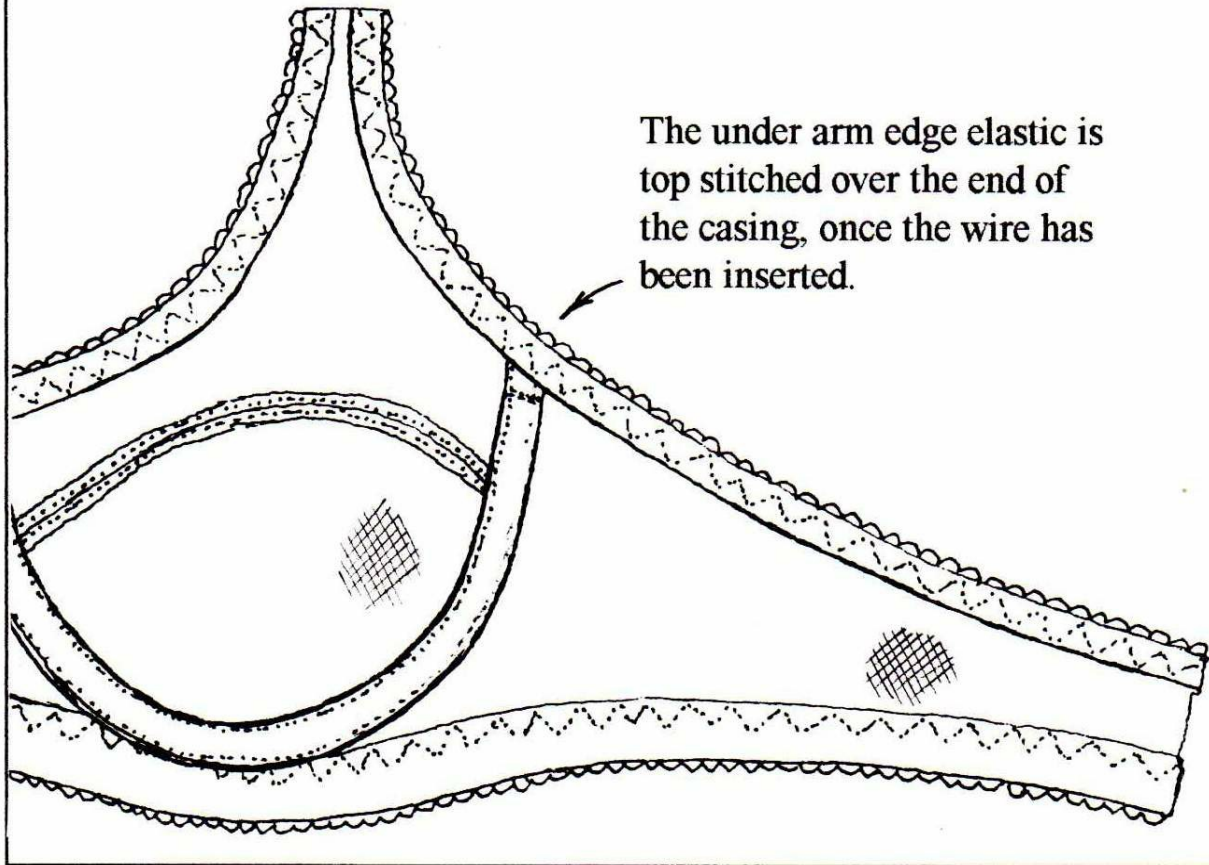


straps are front adjusting and the cup fabric passes through the ring. Alternatively leave an elastic overhang if it is the edging elastic that passes through the ring. If your straps are back adjusting, position the edging elastic so that the finished width of the fabric matches the width of the strap to be sewn to the top point of the cup. Refer to [page 102](#).

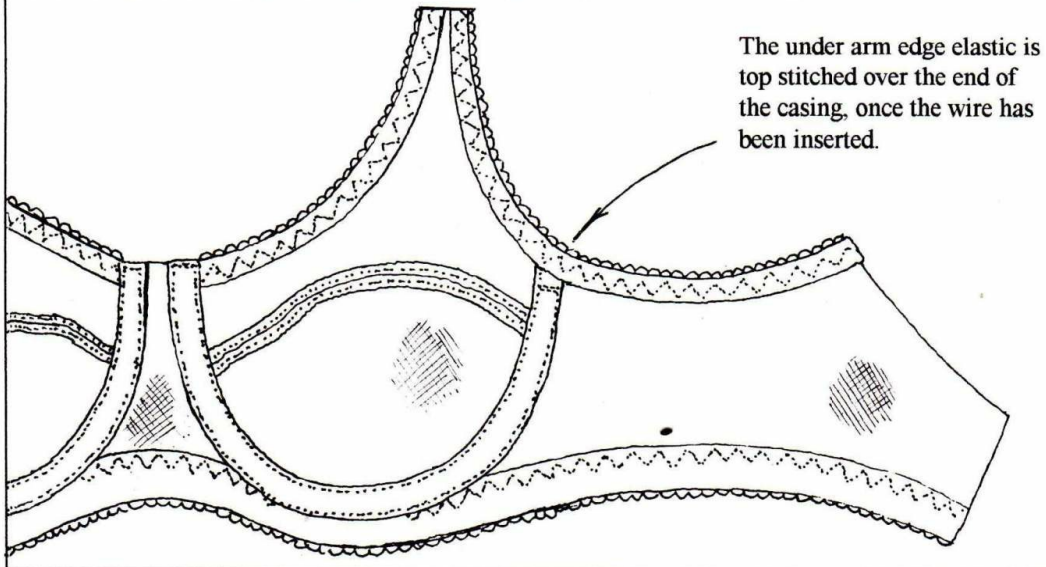
If the design of your bra back is a ***T intersection style***, the armhole edge elastic will extend from the top point of the cup right around to the raw closure edge. Before sewing the edging elastic to the armhole edge, check the height of the closure tab against the centre back edge, referring to the instructions on [page 106](#). When the top left corner of the tab is marked with a dot, the elastic can be positioned for the first line of stitching with the scalloped edge right on this dot, producing a finished top edge of the bra back that will be exactly level with the top of the closure tabs. Diagram 15a.

If the design of your bra back is a ***regular style***, the armhole edge elastic will extend from the top point of the cup to the point where the strap attaches to the bra back. Diagram 15b.

15a. The underarm edge elastic in a bra with a T intersection back.



15b. The underarm edge elastic in a bra with regular styled back. Inside of garment shown.



**16. If your bra straps are front adjusting:**

- stitch rings to the top-most point of each cup, referring to [page 101](#),
- assemble the bra straps according to the instructions on [pages 104](#) and [105](#),
- sew the straps to the bra back according to the instructions on [pages 106](#) and [107](#).

**17. If your bra straps are back adjusting:**

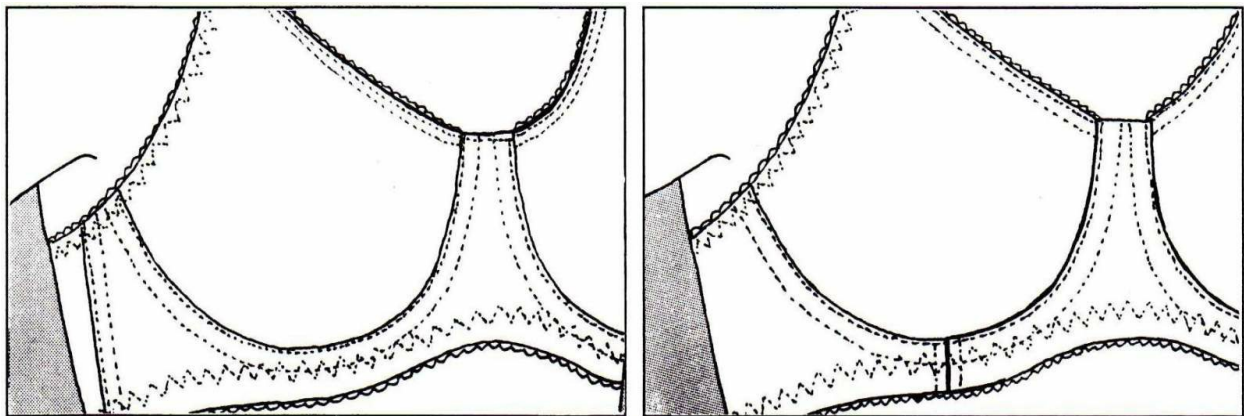
- stitch rings to the bra back, referring to the instructions on [pages 102](#),
- assemble the straps according to the instructions on [pages 104](#) and [105](#), and
- sew the straps neatly and securely to the bra front.

**18. Sew the hook and eye tabs to the bra back** following the instructions on [pages 108](#) to [111](#).

**19. Sew a bow to the centre front.**

A decorative item such as a bow, fabric-covered button, a ribbon-rose etc, can be sewn to the centre of the bra to produce a professional finish. I often sew tiny pearls or glass beads onto the centre of the bow using an extremely sharp beading needle. Beads can also be sewn onto the top point of the cup just below the ring.

**SUMMARY OF UNDERWIRE CASING APPLICATION FOR THIS TYPE OF BRA**



1. **Clip through the wire line seam raw edges** that belong to the bra

body Spread the bra out with the inside surface facing upwards.

2. **Isolate the raw edges** by folding the bra body underneath the cup that you are working on.
3. Lay the casing on top of the raw edges:
  - Leaving a 1cm casing overhang at the centre front edge, and
  - Beginning the casing 1cm below the raw fabric underarm edge.
4. Sit correctly at your sewing machine. Using a **sharp needle** in your sewing machine, and a medium length straight stitch, sew through the stitching on the casing which should be directly on top of the wire line seam stitches. As you sew the casing to the raw edges, **gently stretch the wire line seam raw edges**, so that the casing will turn out of the cup neatly. This gentle stretching should not be overdone: it is only a slight stretching, that should be done mainly on the very curved sections of the wire line seam ... from the top of the centre front edge around to where the seam straightens out ½ way up the side of the cup.
5. **Trim the raw edges** of the wire line seam back hard.
6. Turn the casing completely out of the cup.
7. Turn your work to the **right side**.
8. Sew a line of **pin-stitching** just outside of the wire line seam, (**sewing from the right side** of the garment). Note: all of the casing should lie outside of the wire line seam (to the right of the seam line). Do not excessively pull the bra body away from the cup, as doing this will allow the casing to stray Over into the cup space, causing later problems.
9. Turn your work over and **sew a line of top stitching** along the outer side edge of the casing (**sewing from the inside of the garment**).
10. Using a tiny straight stitch and a low gear on your sewing machine if it has one, **seal off the centre front end** of the casing with two lines of stitches, sewn back and forth. **Insert the wire centre-tip first** from the open, underarm end of the casing and **seal off the channel of the casing above the side tip** of the underwire, again, using a line of tiny straight stitches sewn back

and forth.

Applying the underwire casing in a neat, professional way is the most demanding part of making a bra, and so to assist recall of the various steps in applying casing to the raw edges, a summary of the method has been included.

[page 128]

## Double-casing this type of bra

### ***DOUBLE CASING A BRA WHERE THE RAW EDGES ARE TURNED OUT OF THE CUP***

Once you have sewn a bra and learnt to apply underwire casing properly, if your bras are fairly large in their cup size, you may wish to try double casing a bra. Double casing takes advantage of both the strength of the tape casing and the cushioning nature of the felt type casing. The felt type casing ends up concealing the tape casing in the finished bra. If the tape casing that you are using has a thick side and a thinner side, sew the tape casing to your bra so that the thickest side will end up positioned against the fabric, and the thinner side will end up against the felt-type casing. Doing this will even-out the thicknesses on either side of the wire.

Applying two layers of underwire casing increases the amount of cushioning of the wire against the body, as well as further preventing wire tip penetration, making your bras more comfortable to wear, as well as increasing garment life.

When double casing a bra, the centre front end of the tape casing is sealed off using two lines of tiny straight stitches. The tape casing is then sewn to the cup-side surface of the wire line seam raw edges, using the sewing techniques used when normally applying under-wire casing.

Then felt underwire casing is sewn directly over the tape casing.

Both layers of casing are then treated as one:

- the raw edges are trimmed back,
- both layers of casing are fully turned out of the cup,
- the two layers of casing are pin stitched (using one line of stitching), and then

- they are top stitched to the inside surface of the bra using one row of top stitching (positioned along the outside edge of the felt-type casing).

When the underwire is inserted, it is inserted into the ***central channel of the tape casing***, so that one layer of tape, as well as all the layers in the felt type casing will be between the wire and the body when the bra is worn. The method in full is as follows.

### ***APPLYING DOUBLE CASING TO THE LEFT BREAST CUP (CUP NUMBER 2)***

1. The bra body's wire line raw edges of both cups are clipped through as normal. Refer to step 9 on [page 121](#).
2. Instead of beginning on the right breast cup, as in the former instructions, the tape casing will initially be sewn to the body's left breast cup (cup number 2 as illustrated on [page 122](#)).

#### ***3. Seal off the central channel at one end of the tape casing before you begin sewing it to the bra.***

To do this, use a tiny straight stitch (very small stitch length) and sew two lines of stitching (going back and forth) across the tape near to one end of the length of the tape casing (Diagram 3).

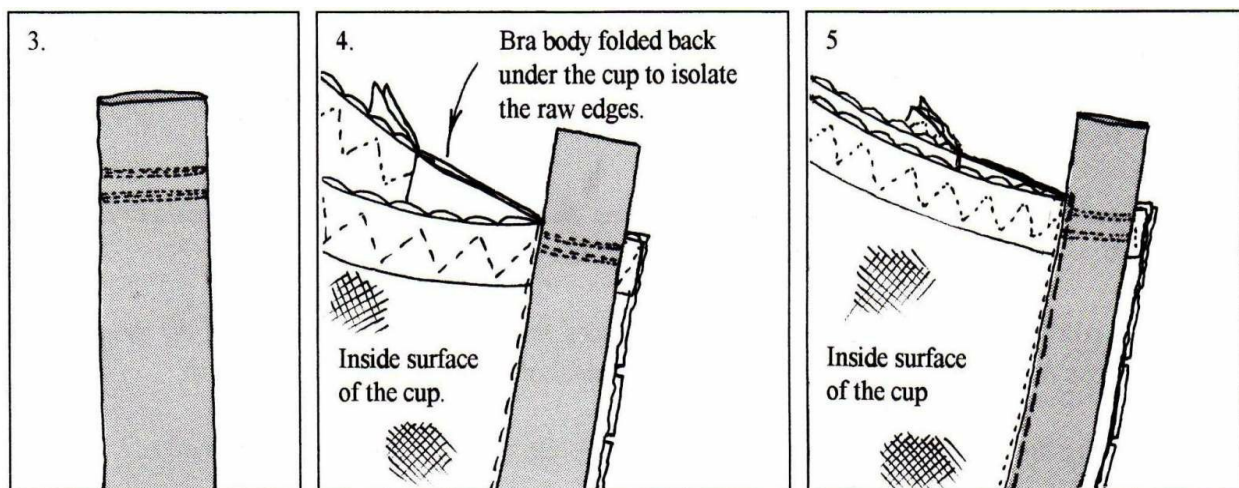
#### ***4. Position the sealed end of the casing onto the raw edges at the top of the centrepiece/neckline edge of the cup, so that when the raw edges are turned out onto the bra body/centrepiece, the two lines of tiny straight stitching will be just below the top finished edge*** (Diagram 4).

[page 129]

#### ***5. Sew the tape casing to the raw edges as per normal*** (Diagram 5).

Because the tape casing is extremely rigid, it is vitally important that you ***slightly stretch the raw edges as you sew the tape casing to them***, otherwise the raw edges and the tape casing sewn to them will be too tight to be turned out of the cup onto the greater-length curve of the bra body. Be sure to stop sewing the casing to the raw edges 1cm below the raw armhole edge so that the casing will not be turned over upon itself when the armhole edge is finished off with narrow scalloped elastic.





6. **Sew the felt casing directly on top of the tape casing** (leaving a casing overhang at the centre front of the bra). The lines of stitching will be directly on top of each other.

7. **Trim back the raw fabric edges of the cup** that are underneath the casings. Trim them back hard.

8. **Turn both types of casing out of the cup** as much as possible.

9. **Sew a line of pin-stitching, sewing from the right side of the bra.** Refer to step 10 on [page 124](#). All layers of casing should be outside of the cup, to the right of the wire line seam that joins the cup to the bra body.

Do not excessively pull the bra body away from the cup as you do this line of pin-stitching, because doing this will make the casings stray over into the cup, causing the pin-stitching to be incorrectly positioned, (making the middle channel of the casing to be too narrow for the wire to pass through).

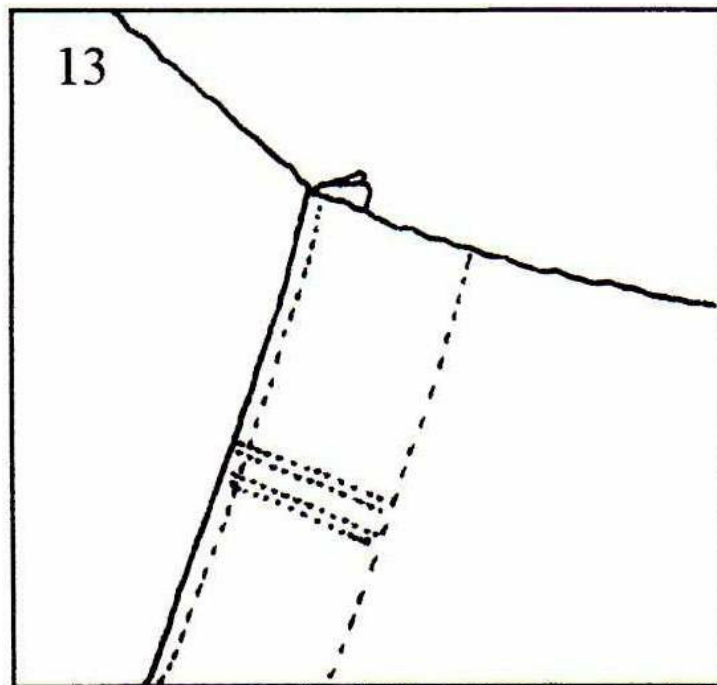
10. **Sew a line of top stitching along the outer edge of the felt casing,** sewing from the inside of the bra. This line of top stitching will probably go through both types of casing and will hold both types of casing to the inside surface of the bra body. The tape casing will now be concealed beneath the felt casing. Refer to step 11 on [page 125](#).

11. **Trim off all casing ends so that they are level with the top finished edge of the centrepiece.**

12. **Insert the underwires,** centre-tip first, into the open underarm end of

the tape casing. The wire should be inserted into the channel of the tape casing.

13. Push the underwire around to the front of the bra as much as possible and just above the position of the underarm/side wire tip, sewing through both casings and the outer fabric of the bra with a tiny straight stitch, sew back and forth for 1cm. ***This will seal off the middle channel of the tape casing above the side underarm tip***, holding the wire stationary inside the tape casing, thus preventing the 'wear and tear' to the casing caused by excessive underwire movement. Diagram 13.



[page 130]

### ***APPLYING DOUBLE CASING TO THE RIGHT BREAST CUP (CUP NUMBER 1)***

When sewing the tape casing to the right breast cup, ***you will be begin sewing the tape casing to the wire line raw edges, starting 1cm below the raw underarm fabric edge***, and proceed to sew it to the raw edges right around to the centre front of the bra, slightly stretching the raw edges as you do so. Because of this, it is impossible to measure the finished length of the casing and thus determine the exact position of the two rows of stitches that will seal off the centre front channel, before the majority of the casing

is actually sewn to the raw edges.

The solution to this problem is to sew the tape casing to the raw edges until you are ***about 2 or 3 centimetres below the finished top edge of the centre front of the bra. Stop sewing here, and remove your bra from your sewing machine.***

***Using a fabric marking pen, draw a line across the casing where the top finished edge of the centrepiece will be, once the casing is turned out of the cup.***

***Using two rows of tiny straight stitches sewn back and forth across the casing, seal off the tape casing just below the line you have drawn.*** The central channel of the casing is now sealed off.

***Finish sewing the tape casing to the raw edges*** of this cup (sew the last 2 or 3 centimetres).

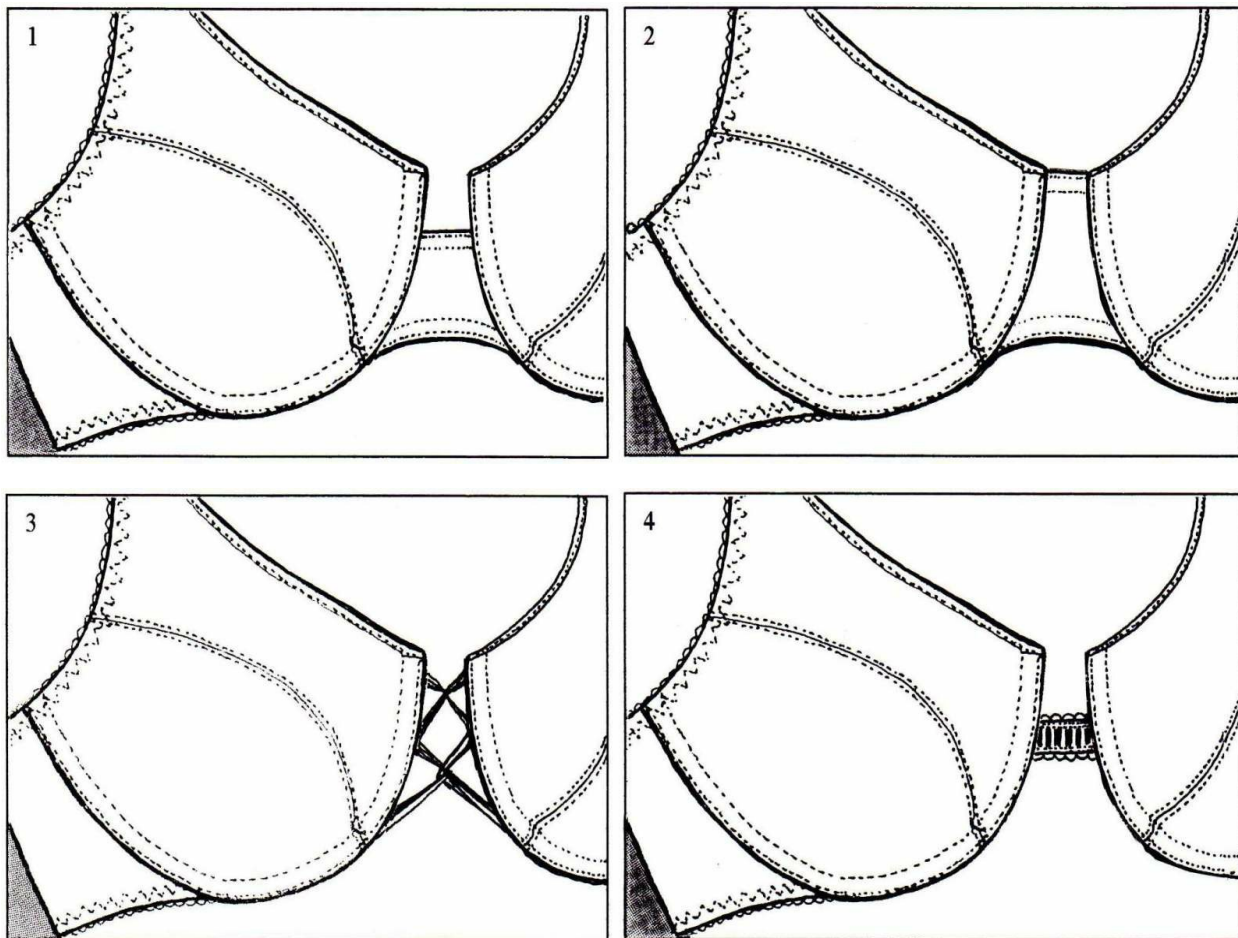
***Sew the felt type casing directly on top of the tape casing*** and follow the instructions from step 7 on [page 129](#) (for the left breast cup).

[page 131]

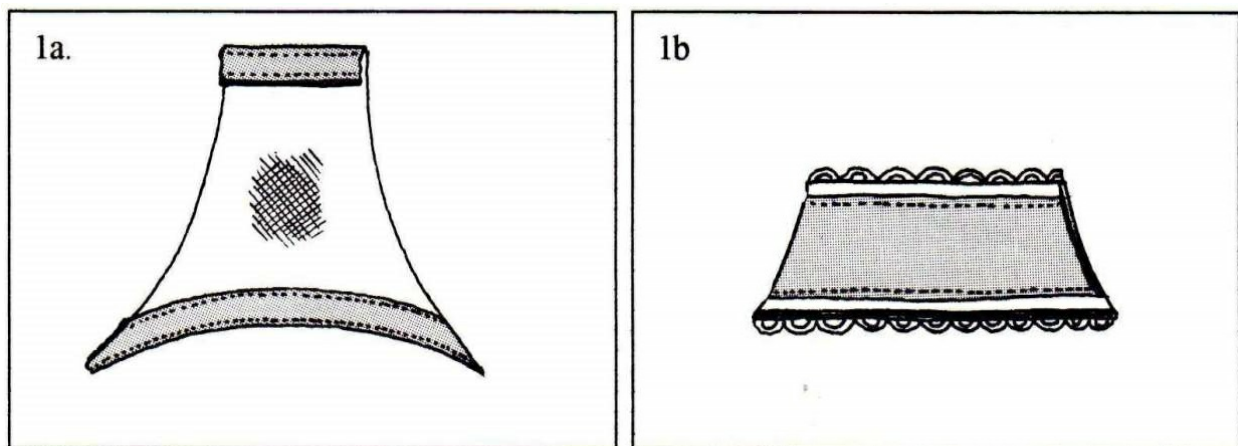
## SEWING INSTRUCTIONS FOR A SMALL CENTREPIECE

**UNDERWIRED BRA** - a bra whose wire line seam raw edges are turned into the cup.

The small centrepiece style of bra can present itself in a number of different varieties as illustrated in the following four diagrams. In the bra in diagram 3, the solid fabric centrepiece has been replaced with interlocked spaghetti straps, and in the bra in diagram 4, it has been replaced with a sturdy piece of tape or reinforced narrow strap elastic.



1. **Hem the upper and lower edges of the centerpiece**, using the pattern's exact seam allowance. Pin stitch along the upper and lower edges, and top stitch close to the raw edge of the hemmed fabric. Diagram 1a. Alternatively if your centerpiece is a short length of reinforced strap elastic, edge stitch a piece of non-stretch tape or ribbon to its underside. Diagram 1b.





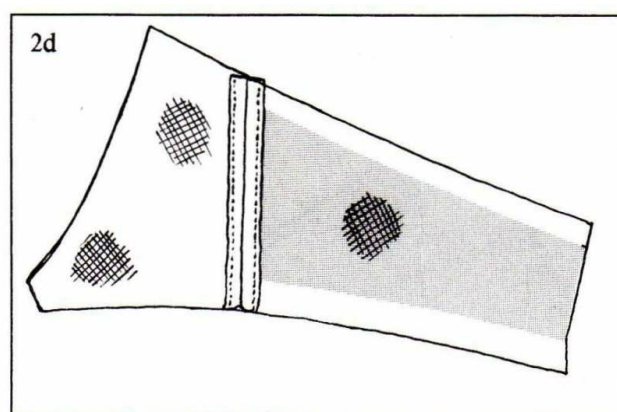
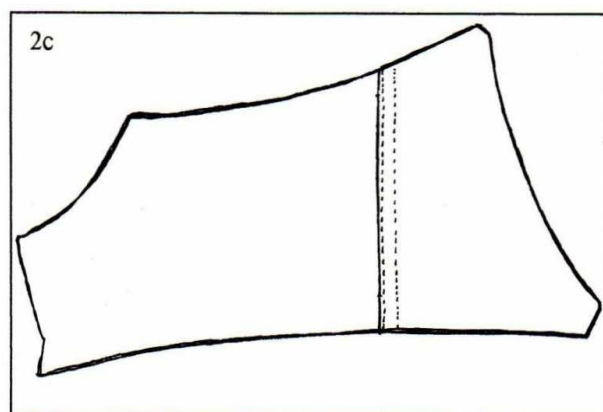
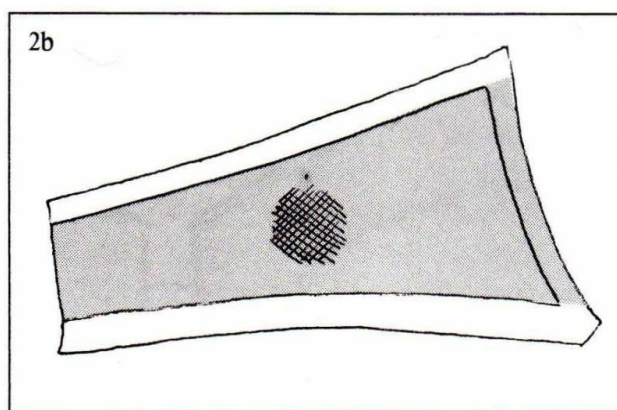
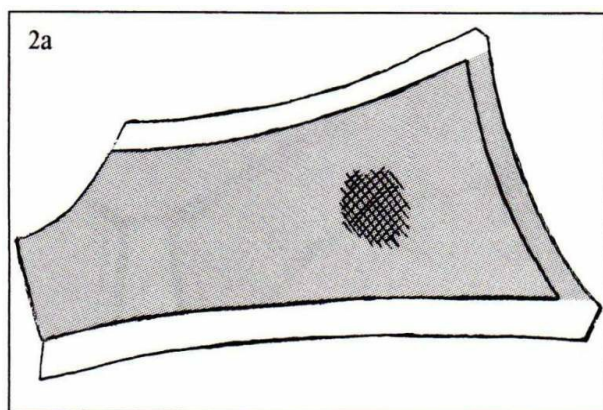
2. If your bra back is in one piece and is self-lined, stay stitch the two layers of each side of the bra back together, using a medium zig zag positioned very close to the raw edges.

If your bra back is a self-lined regular style, it will be similar to diagram 2a.

If your bra back is a self-lined extended T intersection style, it will be similar to diagram 2b.

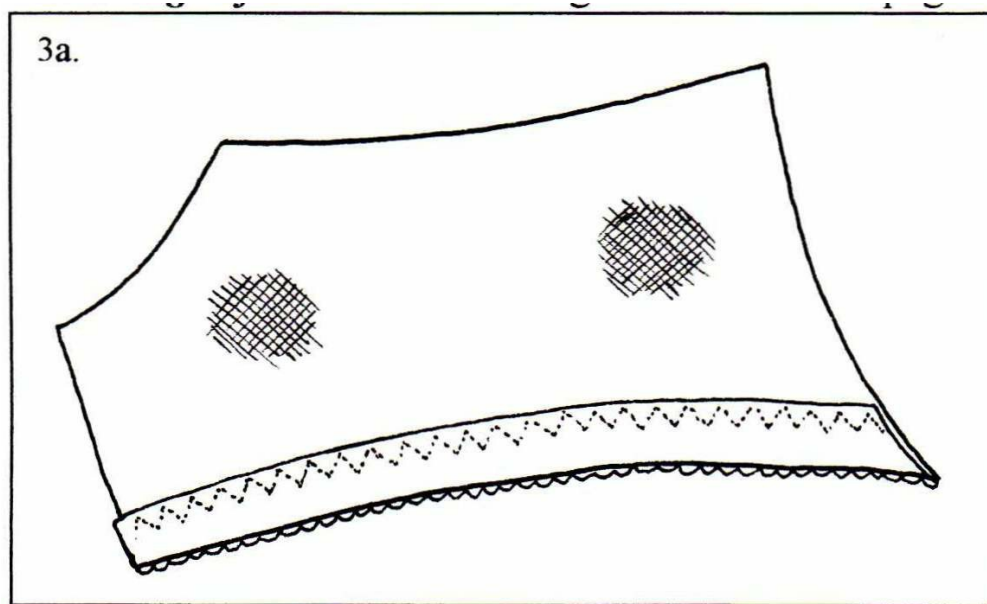
Notice how the lining layer of the bra back only comes to the finished edge along the upper and lower edges of the bra back.

If your bra back is in two pieces, sew the side seam (seam the sidepieces to the bra backs). Trim back the raw edges belonging to the sidepiece, turn both raw edges towards the front and pin stitch and top stitch the raw edges. Diagram 2c. If your bra back is in two pieces, and you are self-lining the stretch portion of it, it will be similar to diagram 2d.



3. Using edging elastic that is the width of the bra back's lower edge seam

allowance, ***elasticise the lower edge of the bra back***. Diagram 3a. Refer to [page 97](#) for the method to be used.



#### 4. ***Assemble each cup and complete its neckline edge.***

If it is required by your pattern, sew line(s) of easing stitch to the upper or lower cup seam lines if required Refer to [page 35](#). Pull the bobbin thread slightly taut to contract the central cup seam a fraction over the tip of the cup. Sew each cup seam (referring to [pages 89](#) and [90](#)), top stitch and trim its raw edges and complete the neckline edge (according to the manner in which the neckline edge has been completed in your pattern bra, or using one of the methods on [pages 99](#) and [100](#)). Refer to the information in step 4 on [pages 116](#) and [117](#) in order to determine the order of sewing the cup seams. ***Do not complete the armhole edge of each cup!*** It is the ***neckline edge*** that must be finished!

[page 133]

A bra pattern is very much like a jigsaw puzzle, and if the cup pieces especially, are joined together incorrectly, the shape of the cup will be adversely affected. As with all patterns, it is of vital importance to:

- correctly align the cup pieces
- correctly align the main stretch/give in each cup piece (according to the arrows on the pattern) and sew the cup seams using a constantly



accurate seam allowance.

### ***Tips for Success***

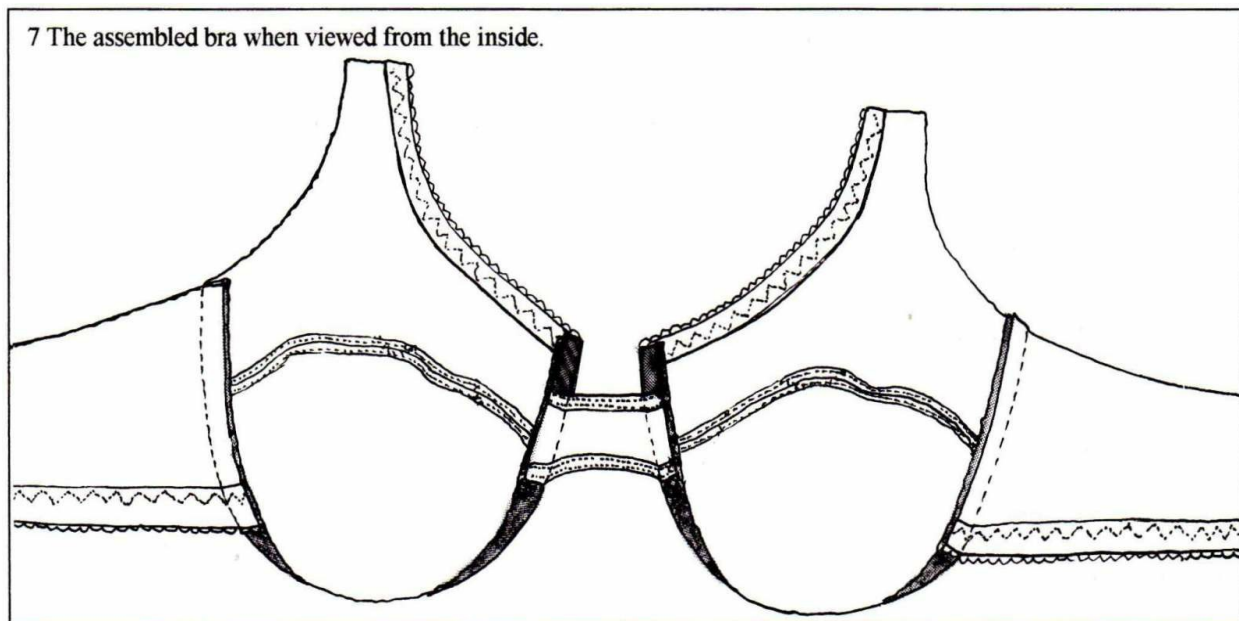
To prevent major construction errors from occurring, I suggest that you observe the following:

- ***Mark all alignment symbols on the right-fabric-side of the cut-out cup pieces.*** These symbols will ensure that the centrepiece and bra back pieces join to the cup in the correct place.
- ***Mark all directional letters and symbols on the right-fabric-side of the cut-out cup pieces.***  
Use a fabric marking felt tipped pen to mark the notches, the centre, side and top of each cut-out fabric piece. (Note that this will only be possible if the colour of the fabric you are working with is light. If working in a dark colour, use liquid paper symbols placed within the seam allowances so that they won't show in the completed garment).
- ***Keep checking your cup pieces against the paper pattern pieces, to ensure that they are correctly aligned in the bra*** (check that the top always faces northward, the word 'centre' always faces towards the centre front of the garment, and the word 'side' always faces towards the side seam).
- At various stages throughout the construction of the cups, always spread out the sections of the cups (right-side up) on the table in front of you, as if the bra is finished and laid out before you. This way any major construction errors will be immediately apparent (e.g. if you have constructed two left breast cups).

5. ***Stay stitch around the wire line edge of each cup*** to prevent it from stretching. Use a long straight stitch that is positioned exactly where the wire line seam will be.

6. With right sides together, using an exact seam allowance, and keeping the raw edges together, ***seam the sides of the centrepiece to the cups***. Ensure that the centrepiece joins to the cups ***according to the alignment points*** that have been marked on your cup pieces.

7. With right sides together, using an exact seam allowance, and keeping the raw edges together ***sew the sides of the cups to the bra back, and the sides of the centrepiece to the cups***. Ensure that the lower finished edge of the bra back is correctly positioned on the side of the cup according to the alignment point that is on both pattern pieces, and that both the top and bottom edges of the centrepiece are positioned correctly on the cup. ***When you are about to sew the bra back to a cup, ensure that you are not about to sew the bra back to the armhole edge of the cup*** (this is a very common mistake).



[page 134]

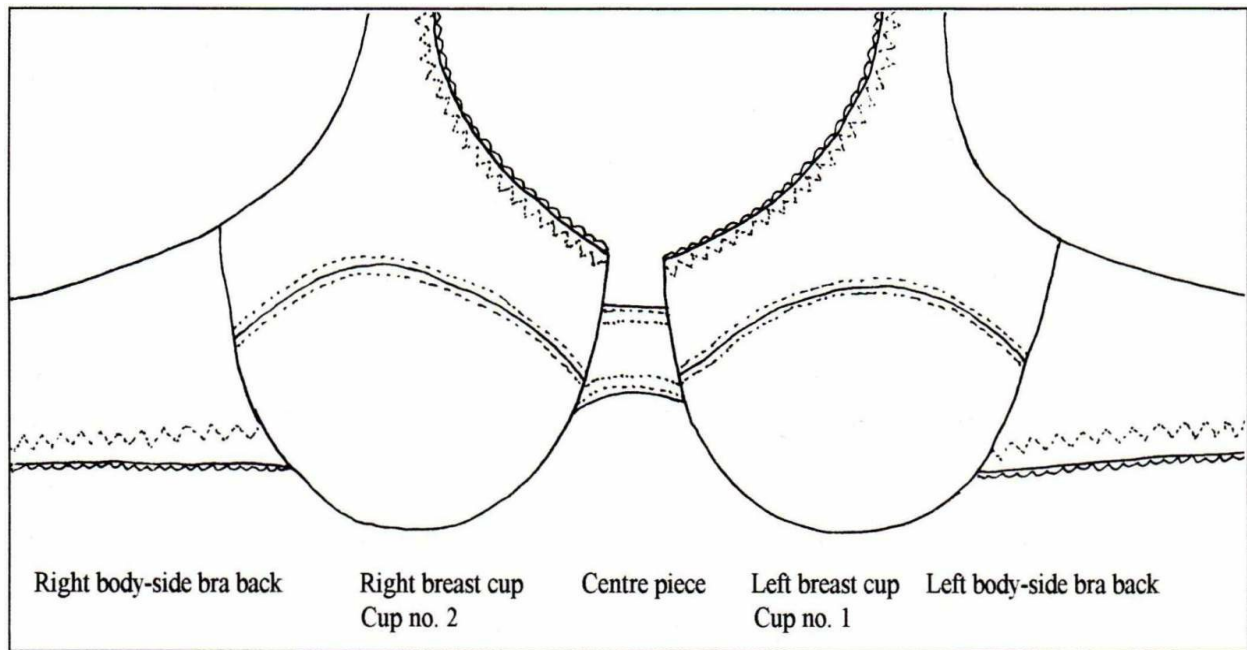
The bra is now assembled. The bra backs (with their finished lower edges), and the centrepiece (with its finished upper and lower edges) are seamed onto the cups in their finished position. The raw edges from these seams are not yet to be trimmed back, as they are needed in applying the underwire casing to the bra. Because there is no bra body under the cups, it is clear that ***all the raw edges around the edges of the cups must be folded into the cups*** so that they will not be visible in the completed garment. Refer to the information in [pages 82 - 85](#).

The underwire casing is to be sewn to these raw edges alone so that when they are folded into the cup the underwire casing covers the raw edges completely.

***The casing therefore has to be stitched to the non-cup side surface of the raw edges.***

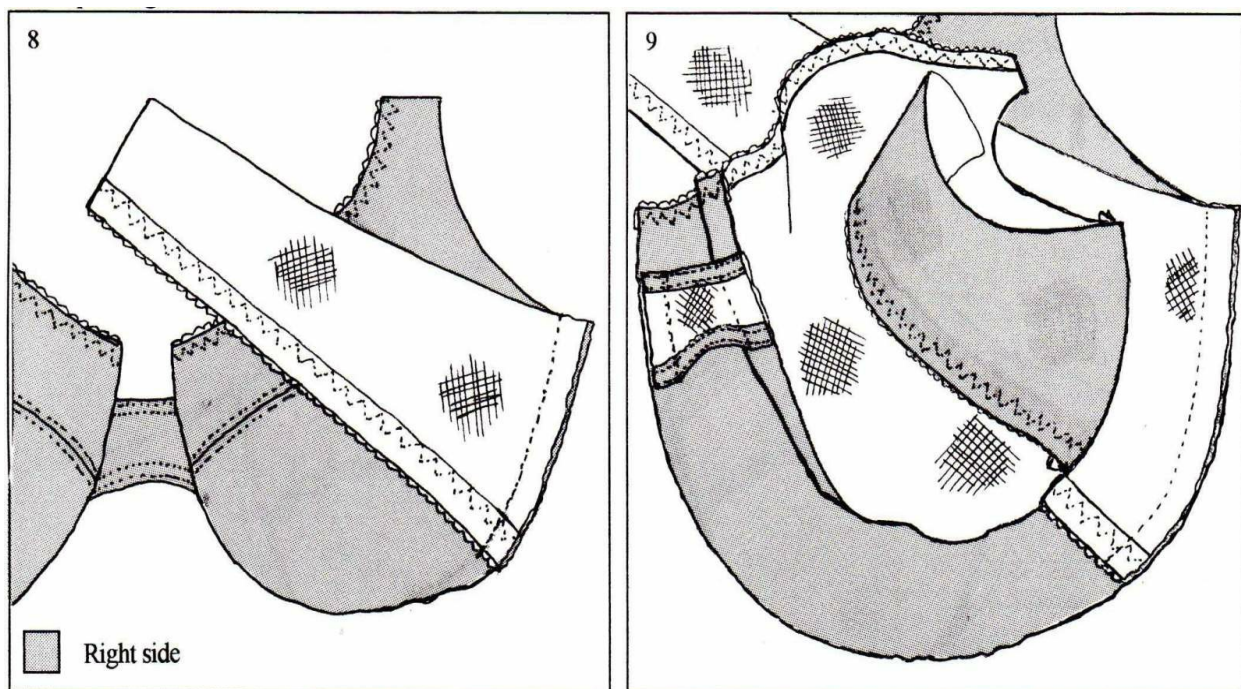
To isolate the raw edges around each cup, and stitch a length of casing to them, work through the following instructions:

Spread the bra out with the ***right-side surface facing upwards*** in front of you.



You are going to sew the underwire casing to the raw edges around the left breast cup first (called cup number 1).

***8. Fold the body's left side bra back (at the far right) back on top of the body's left breast cup*** (the cup adjoining it). The right side of the bra back fabric is now lying against the outer cup fabric of the left breast cup.



[page 135]

9. In a similar manner, ***fold the centrepiece*** (with the other cup and bra back attached to it) ***back on top of cup number 1, folding the whole section over towards your right.***

The outer surfaces of both the centrepiece and cup number 2 are lying against: the outer surface of cup number 1 and the inside surface of the left body bra back (that has been previously folded back over cup number 1). 'Scrunch up' cup number 2 and the bra back attached to it (the one lying on top) into a tight ball so that it lies approximately in the centre area of cup number 1 and doesn't get in the way. The wire line seam raw edges around cup number 1 should now be exposed. Your bra should now appear similar to the one in diagram 9.

Note: The centrepiece of the bra in this diagram has a top edge that is below the neckline edge of the cup at the centre front, creating a U-shaped space at the bra's centre front.

10. ***Lay a length of underwire casing over the raw edges around cup number 1*** so that:

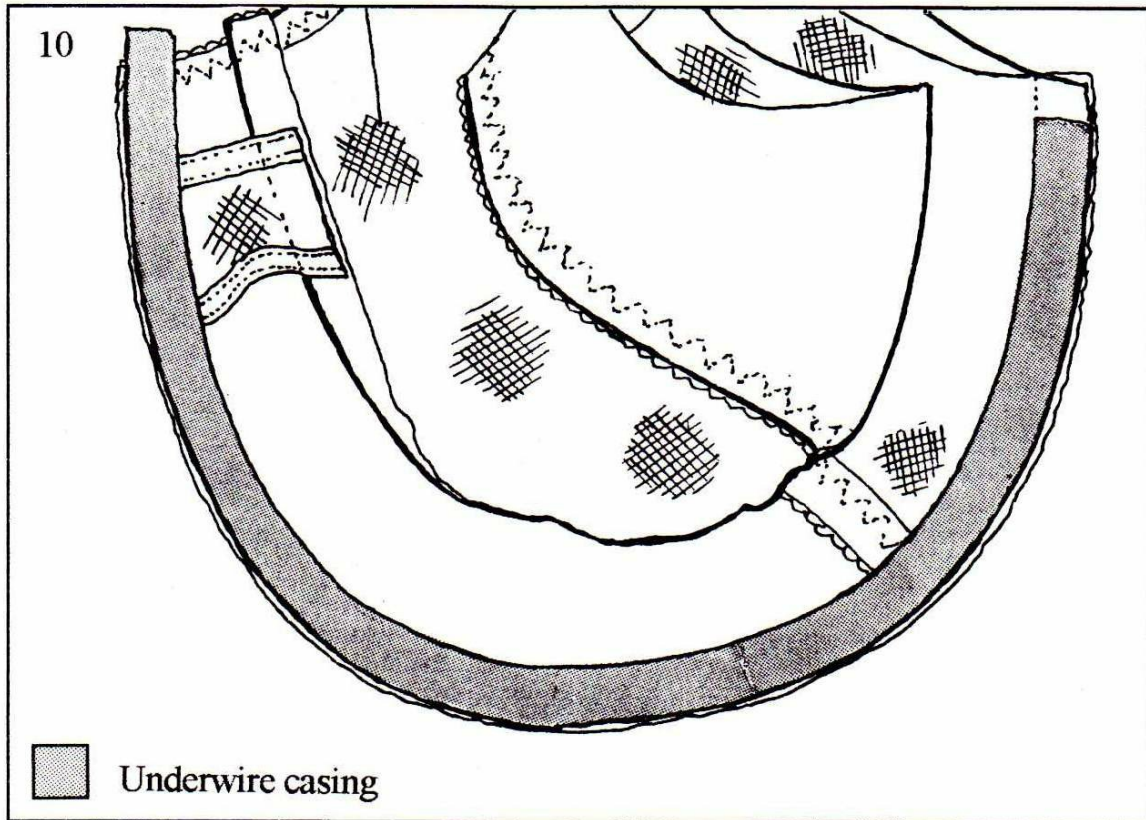
- The width of the casing is sitting on the seam allowance. All of the casing should be to the right of the seam that joins the cup to the

bra back.

- The end of the casing is 1cm below the raw fabric underarm edge of the bra (so that when edging elastic is later applied to the total underarm edge, the elastic and fabric can be folded down neatly over the edge of the casing, preventing the excessive, needle-breaking bulk should the casing itself have to be folded back over onto itself).
- The stitching on the left side edge of the casing is placed directly over the wire line seam (that joins the cup to the bra back).

This placement of the underwire casing should be 'sighted'. Pinning the underwire casing to the bra, doesn't increase accuracy or produce a neater result. To increase accuracy and control as you sew the underwire casing to the bra, have your sewing machine positioned close enough to your body so that your back is straight, not stooped over, and have the sewing machine needle aligned with the centre front line of your body. If your sewing machine has a 'needle-down' position, utilising this capability will also increase your control helping produce a neater finish. The correct placement of the casing is shown below in diagram 10.





11. Using a **sharp needle** on your sewing machine and a medium straight stitch, **stitch along the left side of the underwire casing** (the edge of the casing nearest to the cup), following the line of stitches already on the casing, very close to its left edge. Your line of stitching will also be on top of the wire line seam (the two-piece seam that joins the cup to the rest of the bra).

**As you sew, keep 'straightening out' the wire line seam**, as you do when sewing around a curve using an overlocker/serger. Make the curved edge feed through the sewing machine as if it was a straight-edged piece of fabric. Counteracting the curve like this is necessary to prevent the whole wire line edge of the cup from being stretched by sewing too long a length of underwire casing to it.

[page 136]

**In the sections where there is no bra to the cup, simply keep stitching the casing to the cup along its inner edge, keeping the outer edge of the casing running along the raw edge of the cup fabric.**

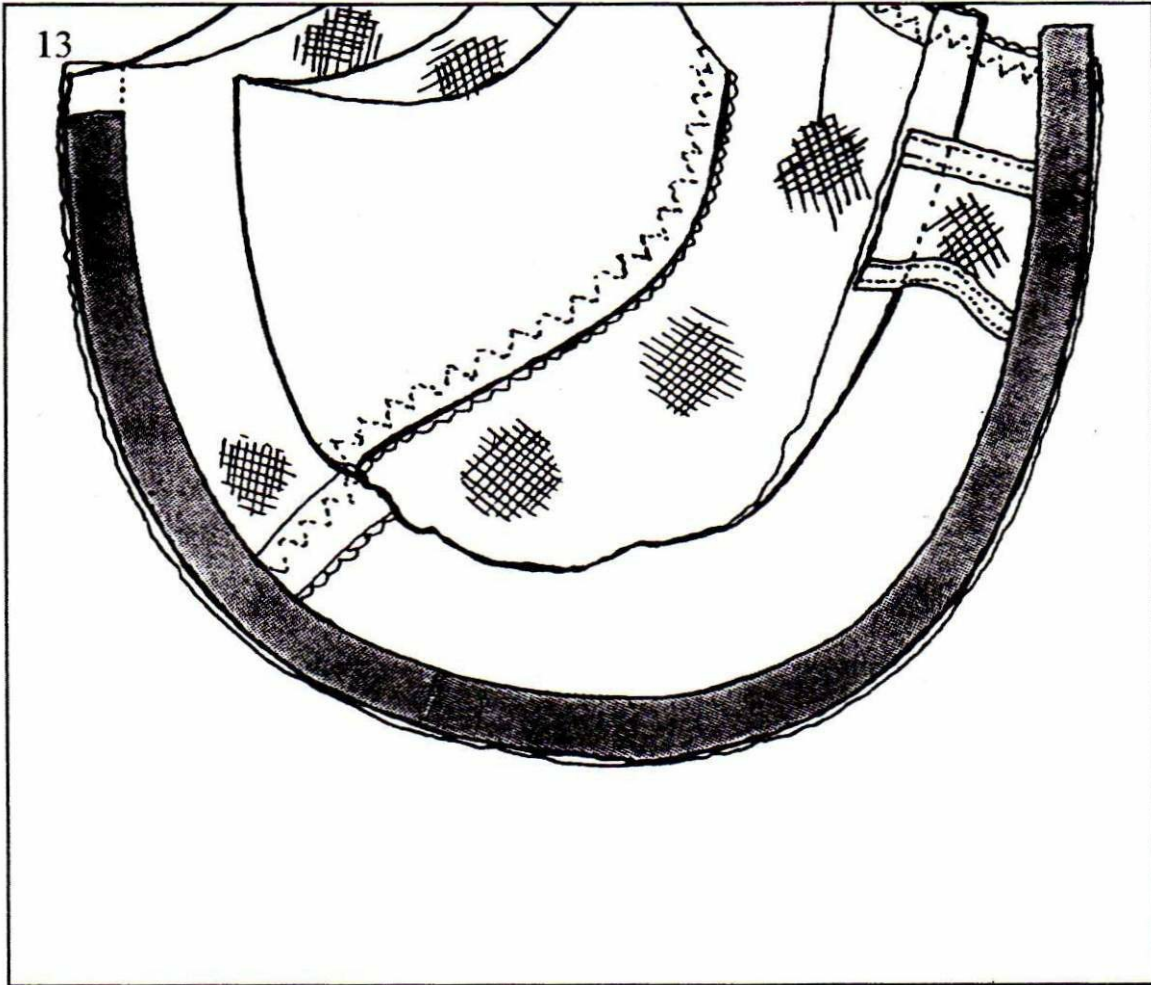


When you come to the top neckline edge of the cup at the centre front of the bra, do a backstitch to secure the line of stitching, and ***leave a casing overhang of at least 2cm***. This overhang will ensure that the casing can later be neatly trimmed off level with the top neckline edge of the cup, at a steep angle if necessary.

To prepare your bra to sew the casing to the raw edges around cup no 2. Spread the bra out in front of you, right-side up as before.

12. ***Fold the body's right-side bra back (at the far left) back on top of the body's right breast cup*** (cup number 2). The right side of the bra back fabric is now lying against the outer cup fabric of the right breast cup.

13. In a similar manner, ***fold the centrepiece (with the other cup attached to it) back on top of cup number 2***. The outer surfaces of both the centrepiece and cup number 1 should be lying against: the outer surface of cup number 2 and the inside surface of the right body bra back (which has been previously folded back over cup number 2). The wire line seam raw edges around cup number 2 should now be exposed/isolated. Diagram 13.



14. Lay the casing on the raw edges, **leaving a 2cm casing overhang at the centre front**. Stitch along the left side of the casing as before, (the side of the casing that is closest to the cup) making sure that your stitches are directly on top of the wire line seam and that you **continue to straighten out the wire line raw edges as you sew**.

15. **Stop sewing 1cm below the raw fabric of the underarm edge** and cut the casing neatly where your stitching ends, cutting the casing off at the same angle as the underarm raw edge.

16. Now that the underwire casing is sewn to the raw edges around both cups, **trim back all the wire line seam raw edges**.

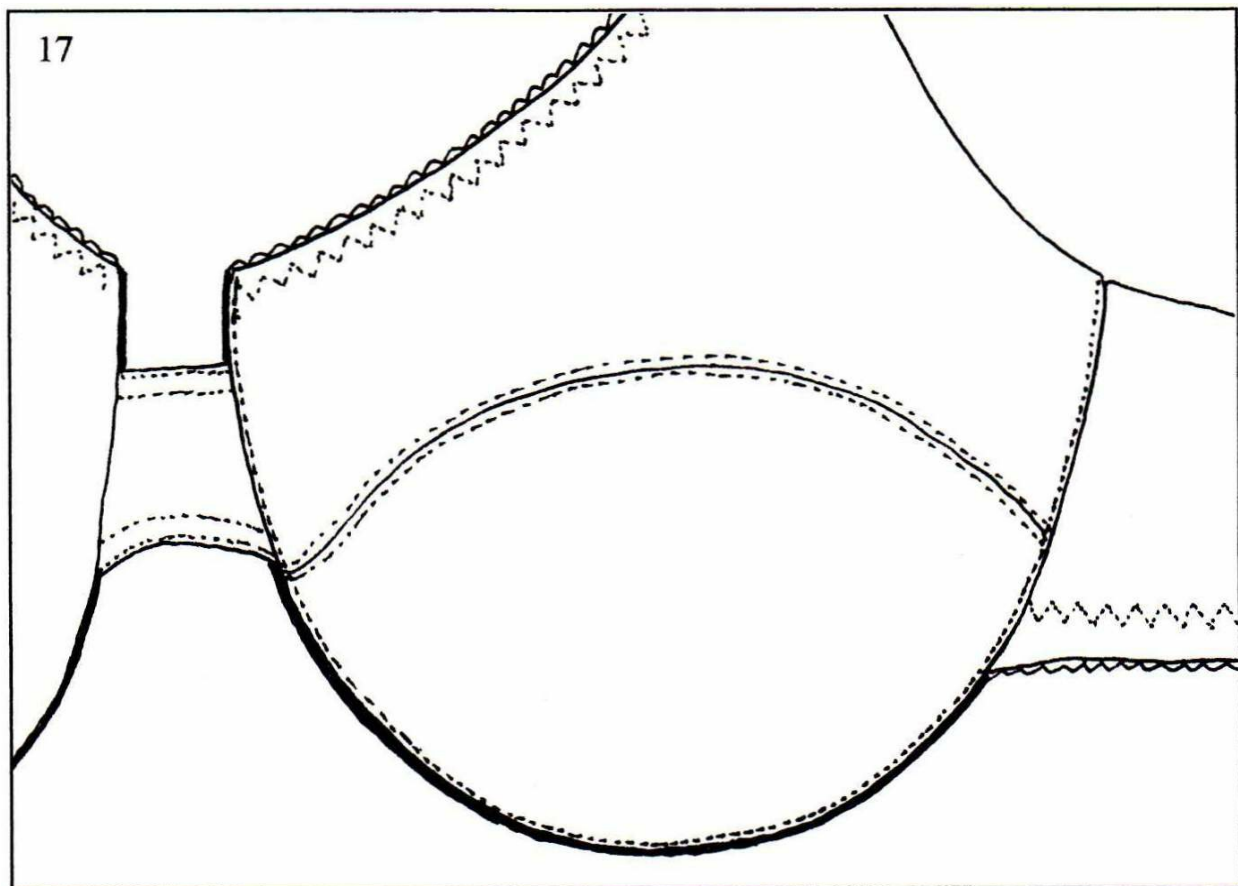
17. The next stage is to **sew the pin-stitching, sewing from the right side of the garment**. Pin-stitching is top stitching that is positioned a pin width

away from the seam line/edge. The purpose of this pin-stitching is to make sure that the casing is folded frilly back under the cup, and to give the bra a tight, professional garment finish. Place the bra right-side up. Turn both lengths of casing into their respective cups. Beginning with cup number 1 sew a line of medium length straight stitches (the pin-stitching) just inside the wire line seam.

[page 137]

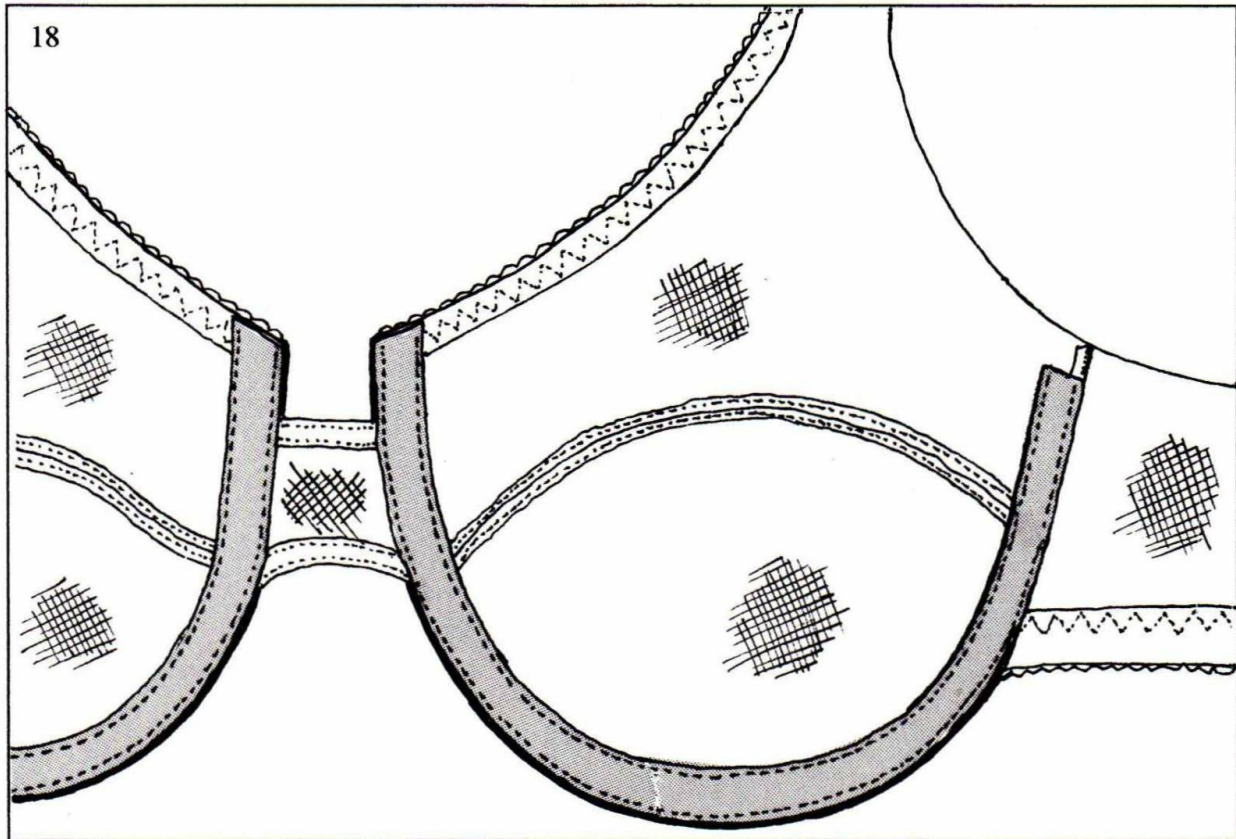
As you sew the pin-stitching, gently pull the cup fabric away from the casing (towards the centre of the cup you are working on) so that a crisp edge to the cup is achieved. When you come to the top of the cup's centre front neckline edge, do a secure back stitch.

In a similar manner sew the pin-stitching on cup number 2, beginning at the top of the cup's centre front neckline edge with a back stitch and sewing around to the underarm edge of the cup. Diagram 17.



**18. Sew the top stitching to both cups along the inner edge of the casing,**

***sewing from the inside of the garment.*** Turn the bra over so that the inside surface of the garment is facing upwards, and sew a line of medium length straight stitches along the inner edge of the casing: the casing edge closest to the centre of the cup. If the casing you are using is double stitched, follow the line of stitching already on the casing. ***When sewing this line of top stitching, ensure that the cup fabric is gently pulled towards the centre of the cup that you are working on.*** Diagram 18.

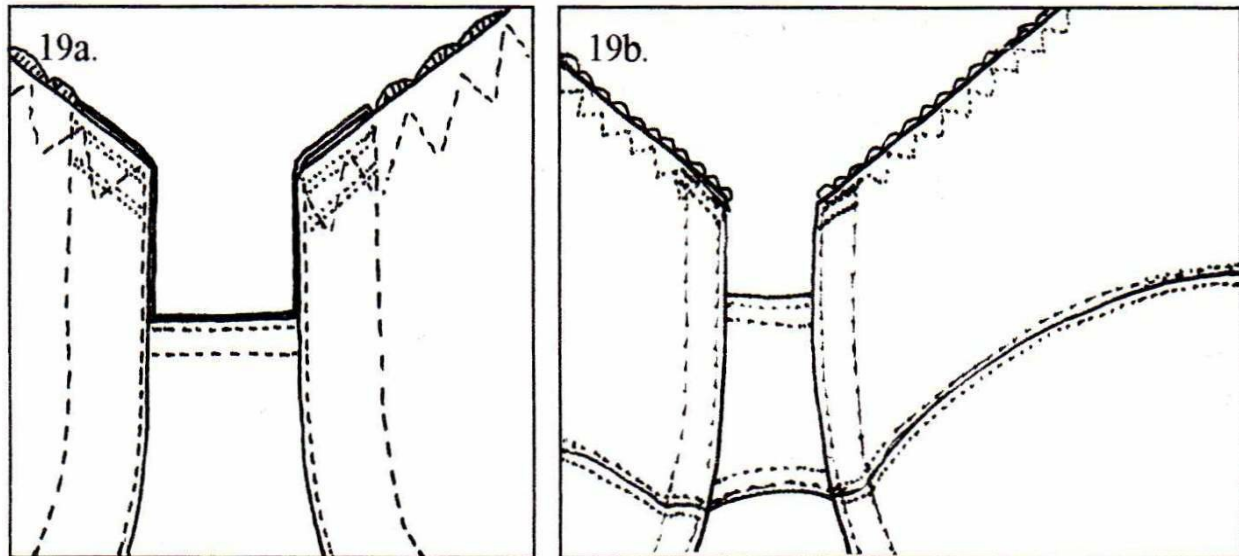


Note: Once you have sewn a few of these small centrepiece bras and your confidence has developed, you may wish to sew the line of top stitching on both cups from the ***right side*** of the bra instead of from the inside. Shifting your needle position slightly to the left and using the edge of the presser foot as a guide will ensure that the top stitching runs parallel to the line of pin-stitching, producing a very professional finish to your garment.

[page 138]

**19. Seal off the top centre front end of the casing** by sewing two lines of very tiny straight stitches back and forth and back again. These two lines of

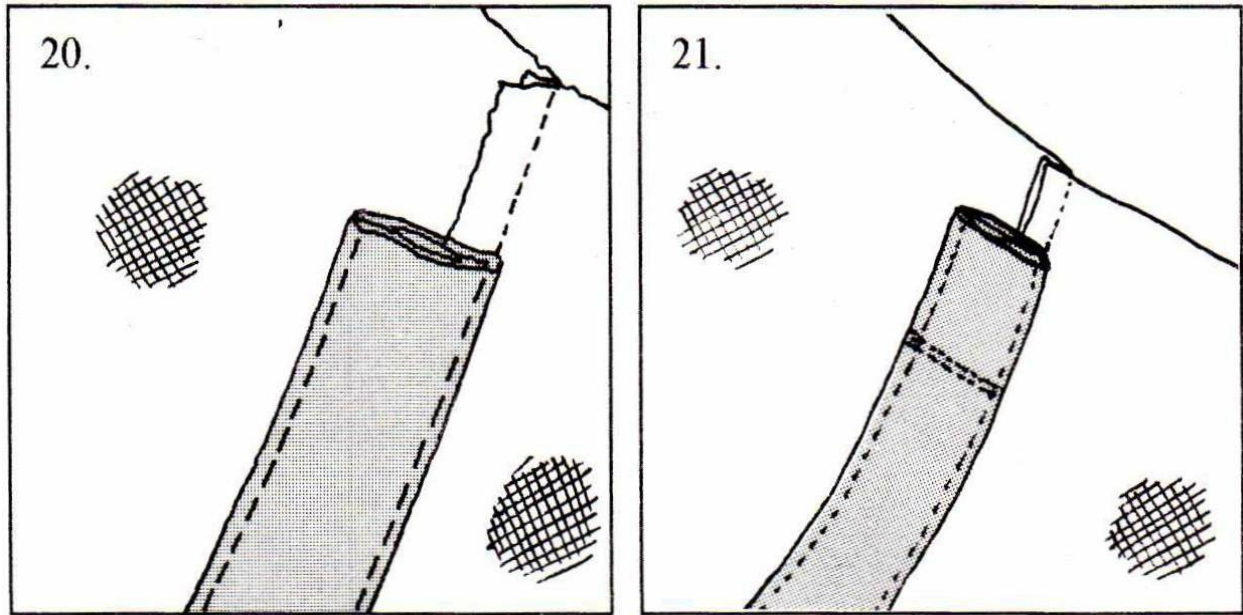
stitching should be very close together, and should be just below and parallel to, the neckline edge. Trim off the overhanging ends of the casing so that it is level with the neckline edge. Diagrams 19a and 19b.



20. ***Insert each wire into the open channel of the casing in the underarm area*** (centre top first), having a few more layers within the casing itself between the wire tip and the inside of the garment than there are between the wire tip and the outside of the garment. Doing this will take into consideration the thicknesses of the outer fabric and better cushion the tip against the skin when the bra is worn (helping to prevent the wire tips penetrating the casing on the inside surface of the bra). Diagram 20.

21. ***Seal off the casing above each underwire's side tip.*** Just above the position of the side tips sew one or two lines of tiny straight stitches. Position your line of stitches as close as possible to the side tip by either using a zipper foot or moving your needle position to the far left. Doing this will reduce the side-to-side movement of the wire within the casing, thus reducing the 'wear and tear' on the casing and prolonging garment life. Diagram 21.





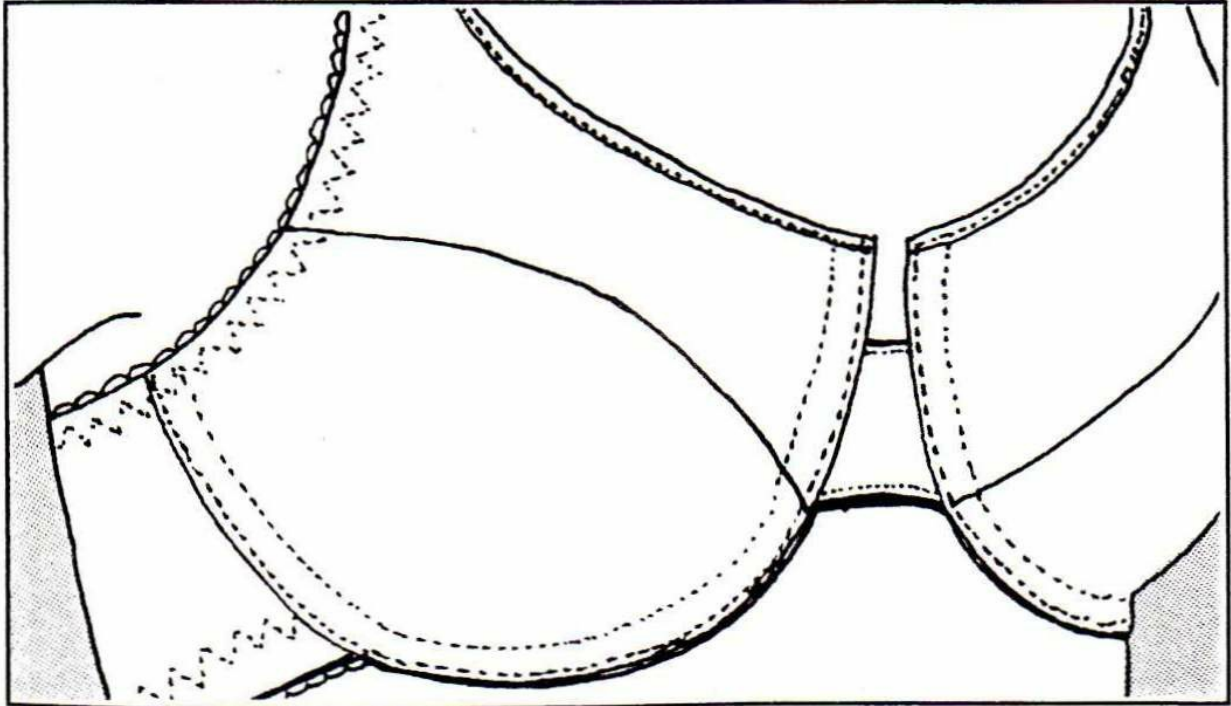
To complete your bra, follow steps 15 to 19 on [pages 126](#) and [127](#).

Applying the underwire casing in a neat, professional way is the most demanding part of making a bra, and so to assist recall of the various steps in applying casing to the raw edges, a summary of the method has been included.

[page 139]

***SUMMARY OF UNDERWIRE CASING APPLICATION FOR THIS TYPE OF BRA***





1. Spread the bra out with the right-side surface facing upwards.
2. ***Fold the rest of the bra back on top of the bra cup that you will be working on*** so that its wire line seam raw edges are isolated.
3. Lay the casing over the seam allowance and ***stitch along its inner edge***, over the wire line seam.  
As you sew this line of stitching, 'straighten the edge out', as if you are sewing the casing to a straight edge.
4. ***Leave a casing overhang at the centre front*** of each cup and end each underarm edge of the casing 1cm underneath the raw fabric underarm edge.
5. ***Trim back the raw edges*** under the casing.
6. ***Turn the casing fully into the cups.***
7. From the ***right side*** of the garment, sew the lines of ***pin-stitching***.
8. From the ***inside*** of the garment, sew the lines of ***top stitching***, gently pulling the cup fabric away from the edges of the cup as you do so.
9. ***Seal off the centre front end*** of the casing.
10. ***Insert the wires***, from the open underarm end of the casing, centre tip first.
11. Seal off the channel of the casing above each underarm tip.

## Double-casing this type of bra

### ***DOUBLE CASING A BRA WHERE THE RAW EDGES ARE TURNED INTO THE CUP***

Once you have sewn a bra and learnt to apply underwire casing properly, if your bras are fairly large in their cup size, you may wish to try double casing a bra. Double casing takes advantage of both the strength of the tape casing and the cushioning nature of the felt type casing. The felt type casing ends up concealing the tape casing in the finished bra. If the tape casing that you are using has a thick side and a thinner side, sew the tape casing to your bra so that the thickest side will end up positioned against the fabric, and the thinner side will end up against the felt-type casing. Doing this will even-out the thicknesses on either side of the wire.

Applying two layers of underwire casing increases the amount of cushioning of the wire against the body, as well as further preventing wire tip penetration, making your bras more comfortable to wear, as well as increasing garment life.

When double casing a bra, the centre front end of the tape casing is sealed off using two lines of tiny straight stitches. The tape casing is then sewn to the cup-side surface of the wire line seam raw edges, using the sewing techniques used when normally applying underwire casing.

Then felt underwire casing is sewn directly over the tape casing.

Both layers of casing are then treated as one:

- the raw edges are trimmed back,
- both layers of casing are fully turned into the cup,
- the two layers of casing are pin stitched (using one line of stitching), and then
- they top stitched to the inside surface of the cup using one row of top stitching (positioned along the inside edge of the felt-type casing).

When the underwire is inserted, it is inserted into the ***central channel of the tape casing***, so that one layer of tape, as well as all the layers in the felt type casing will be between the wire and the body when the bra is worn. The method in full is as follows.

The instructions for double casing this type of bra are very similar to the previous instructions, except for a few differences:

The casing is naturally sewn to the non-cup side of the raw edges as both they and the two layers of casing sewn to them have to be ***turned into the cup*** to be top stitched.

***The two lines of tiny straight stitches that seal off the central channel of the tape casing should be sewn at such an angle that they are going to end up being parallel to the very top of the self-edge of the lace (along the neckline edge of the cup).***

These two lines of tiny straight stitches should again end up being a fraction below the very edge of the lace (or the neckline edge of the cup), and both types of casing should end up being trimmed off level with the neckline edge of the cup.

[page 140]

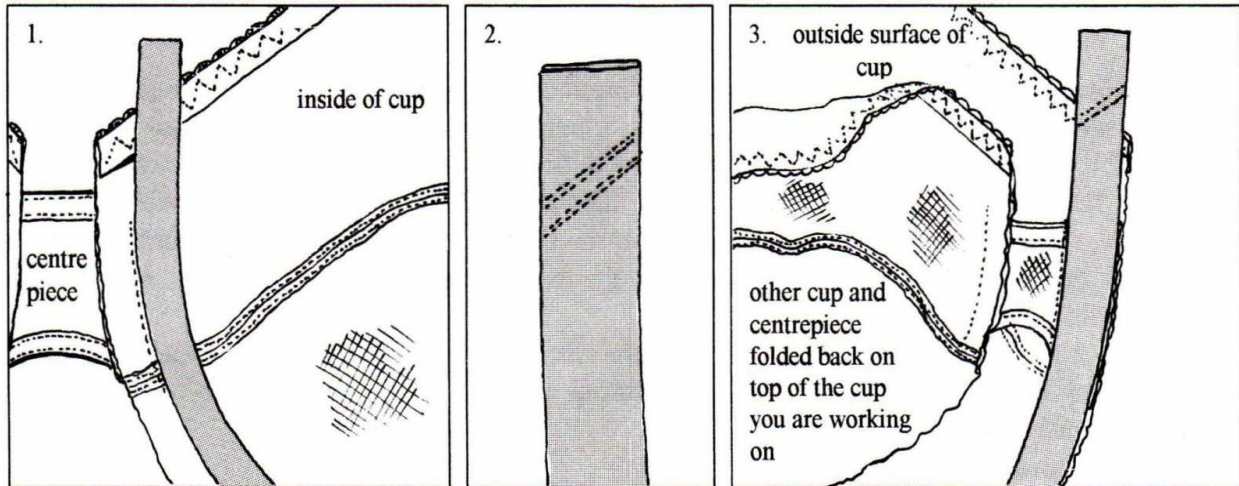
### ***APPLYING DOUBLE CASING TO THE RIGHT BREAST CUP***

1. Lay the top section of a length of tape casing against the ***inside surface of the cup*** leading up to the neckline edge, as it will be in its ***finished position*** (with the edge of the casing 1cm in from the cup's raw edge).

Using a fabric marking pen, draw a line across the tape casing ***directly on top of the neckline edge of the cup***. This line could be at quite a steep angle to the sides of the casing. Diagram 1.

2. Using two lines of tiny straight stitches sewn back and forth, positioned just below this line, and parallel to it, ***seal off the central channel of the tape casing***. Diagram 2.

3. Lay the casing on the raw edges against the outer surface of the cup so that the line you have drawn, comes down at an angle to meet the cup's neckline edge at the top of the seam line that you will sew (1cm in from the cup's raw wire line edge). Diagram 3.



4. Spread your bra out so that the **right-side surface of the bra is facing upwards**. The cup you will be starting with is the cup to your left: the right breast cup (cup number 2 on [page 134](#)). Fold the rest of the bra back over on top of and into the middle of the right breast cup, so that the wire line seam raw edges around this cup are exposed/isolated. **Sew the tape casing to the raw edges** as normal, 'straightening the raw edges out' as you do so, as if you are sewing a curved edge with an overlocker/serger. Refer to step 7 on [page 136](#).

5. Stop sewing 1cm below the raw fabric edges along the underarm edge of the bra and trim the casing off 1cm under the raw underarm edge of the fabric.

6. **Sew the felt casing directly over the tape casing**, leaving a 2cm casing overhang at the centre front of the bra so that it can be later neatly trimmed off level with the finished, centre front neckline edge of the cup.

[page 141]

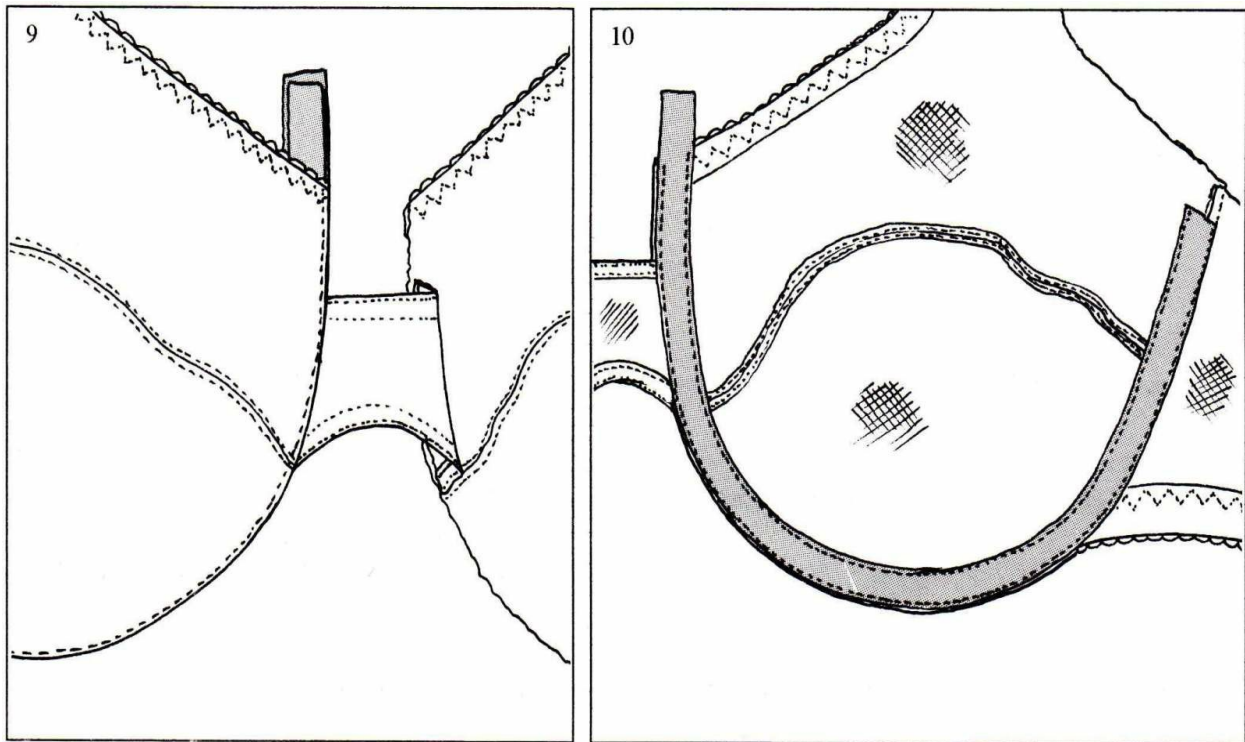
7. **Trim back all the raw edges** that lie underneath the casings.

8. **Turn both casings fully into the cup.**

9. Sewing from the **right** side of the bra, **sew the pin-stitching** just inside the outer margin of the cup. Diagram 9.

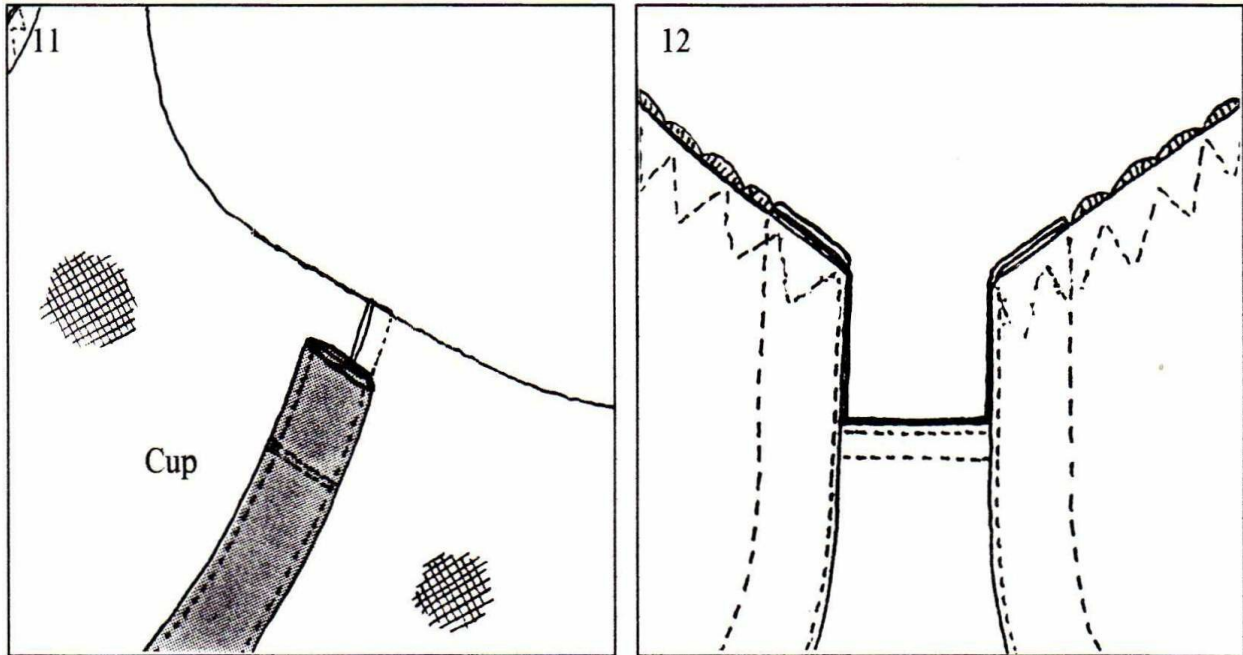
10. Sewing from the **inside** of the bra, sew the **top stitching** along the inside edge of the felt casing. The felt casing will conceal the tape casing

underneath it. Diagram 10.



11. ***Insert the wires into the channel of the underarm end of the tape casing*** (centre tip first, of course) and seal off the casing channel as normal, (referring to step 21 on [page 138](#)). Position your line of tiny straight stitches through all the thicknesses of the casings as well as the cup fabric, just above the side tip of the underwire. Diagram 11.

12. Trim off both casings level with the centre front neckline edge of the cup. Diagram 12.



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### **APPLYING COUBLE CASING TO THE LEFT BREAST CUP**

When sewing the tape casing to the left breast cup, ***you will be begin sewing the tape casing to the wire line raw edges, starting 1cm below the raw underarm fabric edge***, and proceed to sew it to the raw edges all around to the centre front of the bra. Because of this, it is impossible to measure the finished length of the casing and thus determine the exact position of the two rows of stitches that will seal off the centre front channel, before the majority of the casing is actually sewn to the raw edges. The solution to this problem is to sew the tape casing to the raw edges until you are about 2 or 3 centimetres below the finished top edge of the centre front of the bra. Stop sewing here, and remove your bra from your sewing machine. Seal off the channel of the tape casing at the correct angle, and finish sewing the tape casing to the raw edges. The method in detail is as follows:

1. ***Sew the tape casing to the raw edges*** as per normal, having the raw end of the casing 1cm below the raw fabric underarm edge when you start sewing. Refer to steps 8-11 on [pages 134](#) and [135](#). Continue sewing the casing to the raw edges, 'straightening the raw



edges out' as you do so, as if you are sewing a curved edge with an overlocker and ***until 2 or 3cm below the finished neckline of the cup at the centre front***. At this point, cease sewing the casing to the raw edges and remove the bra from the sewing machine.

2. Turn the raw edges and the casing into the cup where it will be ultimately positioned, and with a water- soluble fabric-marking pen, ***draw a line across the casing directly on top of the finished neckline edge***.
3. Using two lines of tiny straight stitches sewn back and forth, positioned just below this line, and parallel to it, ***seal off the centre front middle channel of the tape casing***.
4. Finish sewing the tape casing to the raw edges right up to the neckline edge ***where a secure backstitch*** can finish your line of sewing.

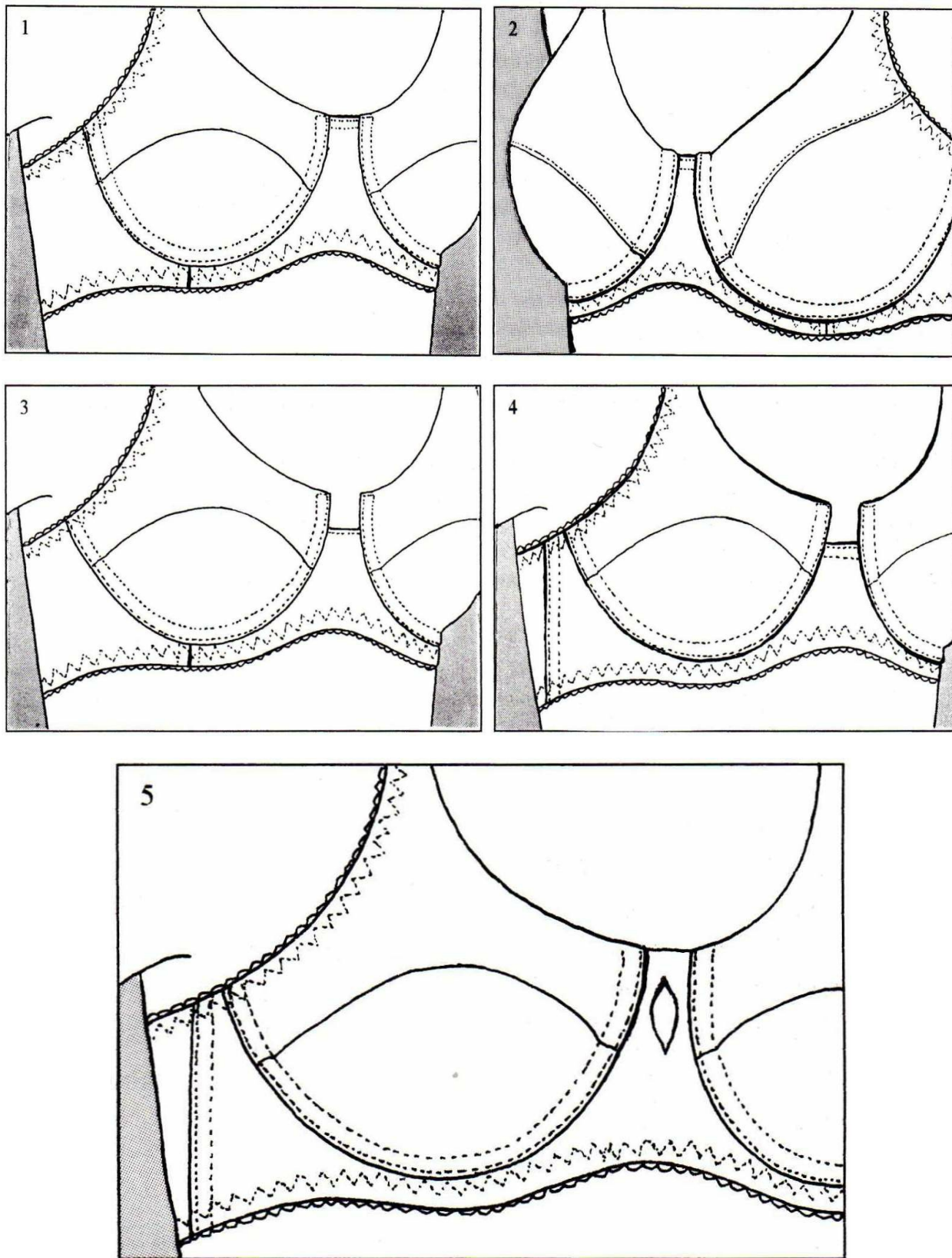
Follow the previous cup's instructions from step 6 to step 12 ([pages 140 and 141](#)).

[page 143]

## SEWING INSTRUCTIONS FOR A Y CENTREPIECE OR EXTENDED CENTREPIECE BRA - WHERE THE WIRE LINE SEAM RAW EDGES ARE TURNED INTO THE CUP.

Some bras at first glance appear to be standard Y centrepiece or extended centrepiece bras, but unexpectedly, have the wire line seam raw edges turned ***into*** the cup.

- If your pattern bra has a very small cup size, it may have the wire line seam raw edges turned into the cup. Diagram 1.
- Your pattern bra may be a Y centrepiece or extended centrepiece bra, but the manufacturers for no apparent reason, have turned the casing into the cup to be top stitched, making it atypical. Diagram 2.
- If there is an exposed section of the wire line seam in a Y centrepiece or extended centrepiece style, this will also necessitate turning the line seam raw edges into the cup. Diagrams 3, 4 and 5.



If the style of your pattern bra is similar to one of the above examples,

constructing your bra is a simple matter of assembling the bra body, hemming its centre- front top edge and hemming around any other openings in it. The cups are to be assembled, and their neckline edges completed. The cups are then seamed into the cup spaces in the bra body. Particular attention must be paid to the bra's alignment points (if a section of the wire line seam is exposed) i.e. the cups and the bra body have to be positioned correctly with respect to each other.

Complete the bra using the instructions from [page 134](#) to [page 138](#). The only difference in your bra, will be the fact that instead of being in two sections, the bra body will be a whole piece that extends under the cups. To isolate the wire line seam raw edges around the cup you are working on, simply spread the bra out, right-side surface upwards, and ***fold all the rest of the bra back into the centre of the cup that you are working on.***

[page 144]

## GENERAL SEWING INSTRUCTIONS FOR A PADDED BRA

If your favourite padded bra contains moulded padding, this type of bra is impossible for the home sewer to replicate, as we have neither the equipment nor the method available.

The types of padded bras that we can replicate have a seamed outer fabric/lace cup covering a seamed inner padding cup: a double layered cup where the two layers are stitched together along the neckline edge. All the cup seam raw edges are contained in between the two layers of the cup, producing a neat garment finish on the inside of the total cup.

The padding is generally fine polyester wadding that has a lining fabric bonded to it. The raw-wadding side of the padding lies against the back/underside of the outer cup fabric/lace, and the lining fabric that is bonded to the wadding lies against the skin of the breast when the bra is worn.

***The patterns of the outer fabric/lace cup and the padding cup are often completely different.*** The outer fabric/lace cup's pattern pieces are usually slightly smaller than the pattern pieces of the padding cup. When the two layers of the total cup are combined, the outer fabric/lace layer has to be slightly stretched so that their raw edges meet around the wire line edge of the cup. This slight stretching of the outer cup over the padding cup

produces a tension between the two layers of the cup that gives the two-layered cup, extra garment 'body' and shape.

These bras are often the most successful of the 'push-up' or breast maximiser types of bras. The figure shaping that the best of these types of bras provide, while being very flattering and bust enhancing, appears natural- looking, (not over-padded and artificial).

***The shapes of all the cup pieces, as well as the direction of the 'give' in the cup sections is of critical importance, affecting the shape of the breast in the finished bra.*** To replicate these types of bras, it is absolutely necessary to cut one of the cups apart along its seam lines so that the fabric and padding cup pieces can frilly relax before their shapes are traced. Accuracy is vital if the same successful cup shape is to be reproduced.

When drafting the pattern for the padding cup, I suggest that the padding around the armhole edge only come to the finished armhole edge of the outer fabric/lace cup (the cutting line on the padding cup pattern will be the finished edge of the outer cup pattern). This will produce a neater, more professional result, as when the armhole edge is finished off with elastic, the outer cup fabric (with the elastic sewn to it) will turn over the raw edge of the padding (the padding will not have to be folded over onto itself).

If the padded bra has an elliptical padded form inserted into a fine fabric pocket behind the lower cup, this is very easy to reproduce. Simply draft the pattern of the pocket piece, hem the edge of its opening, and stay stitch the pocket in its finished position behind the lower cup (padding cup). The lower cup (padding cup) and the pocket attached to it are then treated as one, and it can be seamed to the upper cup (padding cup).

The sewing instructions for a padded bra are only slightly different to a non-padded bra. The same principles apply. The only difference is in the construction of the cups: when the cups are cut out, there are four cup layers to assemble (instead of two): the two outer fabric/lace cups and the two padding cups.

***Each total (double layered) cup has to be assembled and its neckline edge completed before it can be seamed to the bra body*** (following the usual set of sewing instructions for your style of bra).

Once the total cup has been assembled (with its neckline edge completed),

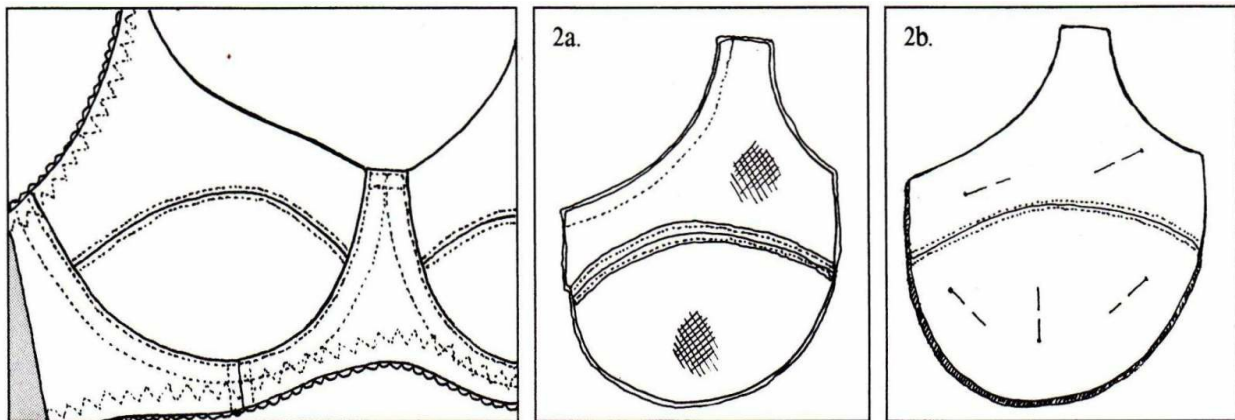
the wire line seam raw edges of the padding and outer cup layers are stay stitched together so that the total cup can be treated as one when being seamed to the bra body.

The following are two examples of slightly different underwired, padded bra cups.

[page 145]

## Two Types of Padded Bra Cups

### ***A PADDED CUP THAT IS SEAMED ALONG THE NECKLINE EDGE***



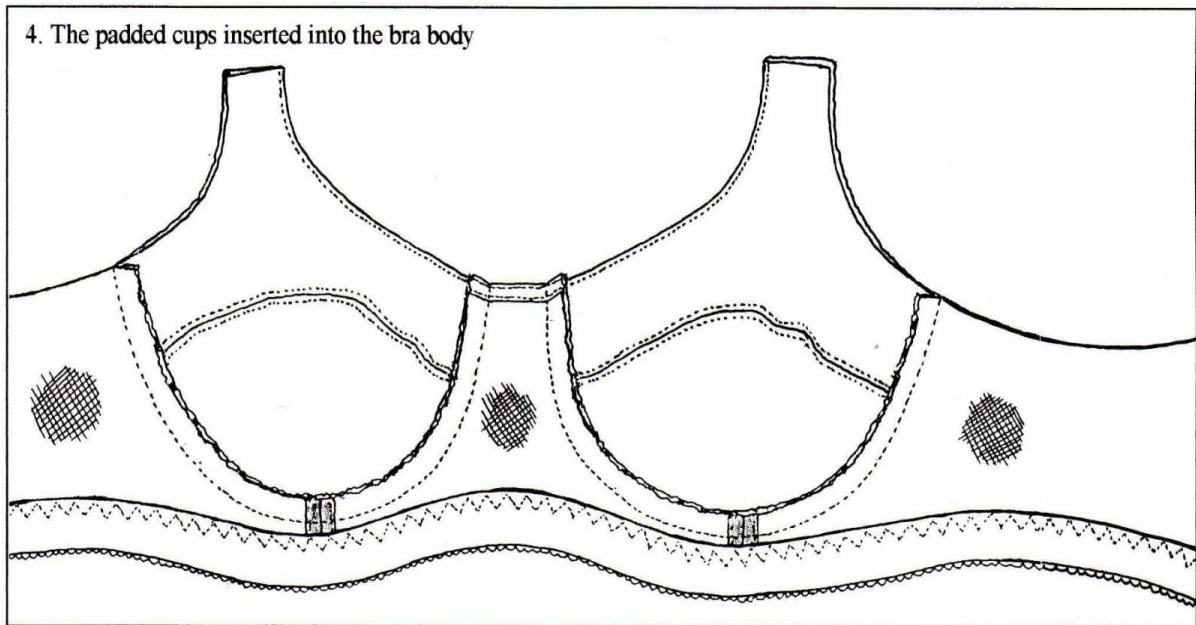
***If the padding layer and the outer cup layer are seamed together along the neckline edge*** (as is the case in the bra style above left), the sewing instructions for assembling the cups are as follows:

1. ***Assemble the separate layers of each cup.*** Sew lines of easing stitching to the central cup seam lines as required by the pattern. The bobbin thread is pulled taut to slightly contract the mid cup seam line over the tip of the cup. The separate padding cups and the outer cups are assembled. (Sew the upper cup pieces to their respective lower cup pieces). The raw edges of the seams are top stitched and trimmed back hard to prevent a build up of seam line bulk. This close top stitching and trimming is especially important on the padding cup.
2. Seam each outer fabric/lace cup to its respective padding cup along the neckline edge: ***pin the bonded (lining) side of the padding to the right-side surface of the outer cup layer*** along the neckline edge.



This seam is sewn, the raw edges trimmed back hard, and the remaining raw edges are pin stitched to the padding layer, just under the seam (to produce a crisp neckline edge). Diagrams 2a and 2b.

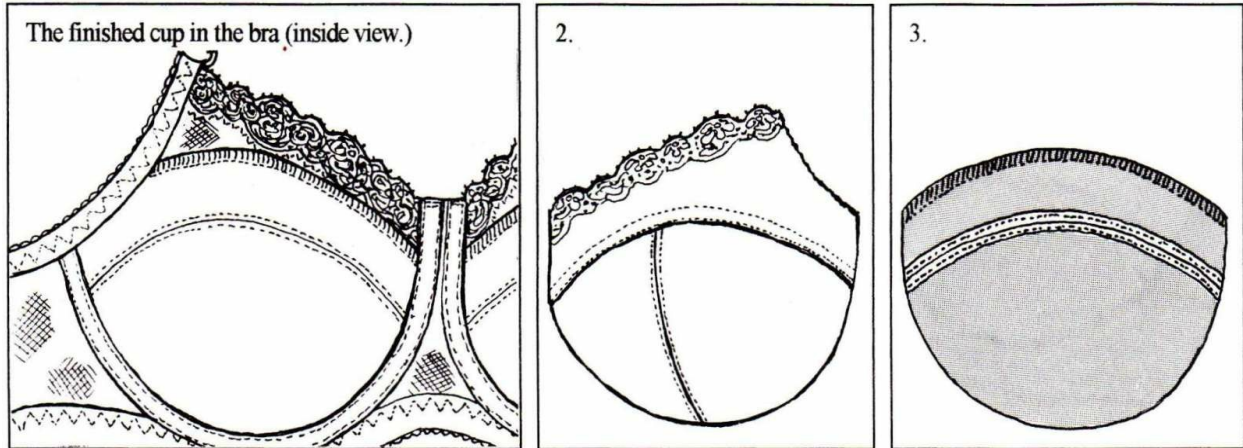
3. Turn the total cup right-side out. The raw wadding surface should be in the centre of the layers, against the undersurface of the outer fabric/lace cup.
4. Sew each total cup into its cup space in the bra body which has been previously prepared. Diagram 4. Complete the bra according to its sewing instructions (the nature of which will be determined by whether the wire line seam raw edges are turned out of the cup or into the cup: follow on from step 8 on [page 119](#) or Alternatively from step 6 on [page 133](#)).



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### ***ANOTHER TYPE OF PADDED CUP***





***If the padding layer and the outer cup layer have separate neckline edges*** (as is the case in the bra style above left), the sewing instructions for assembling the cups are as follows:

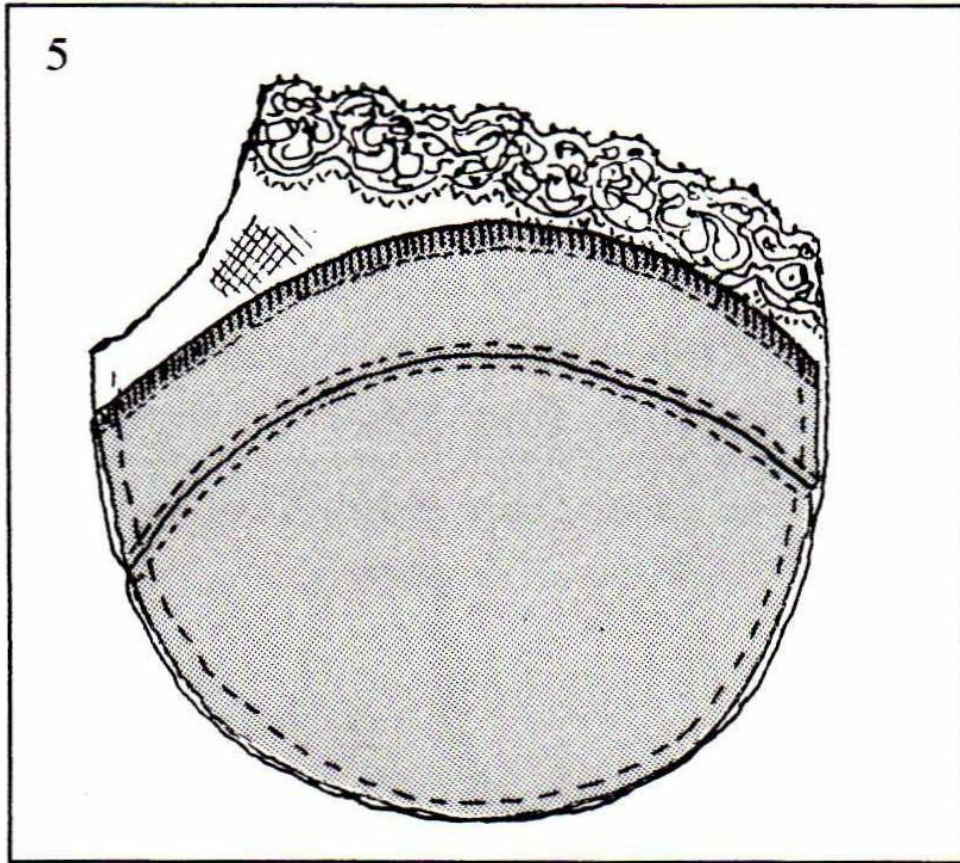
1. ***Assemble the separate layers of each cup.*** Sew lines of easing stitching to the central cup seam lines as required by the pattern. The bobbin thread is pulled taut to slightly contract the mid cup seam line over the tip of the cup. The separate padding cups and the outer cups are assembled. (Sew the upper cup pieces to their respective lower cup pieces). The raw edges of the seams are top stitched and trimmed back hard to prevent a build-up of seam line bulk. This close top stitching and trimming is especially important on the padding cup.

2. ***Complete the neckline edge of each outer fabric/lace cup.*** Diagram 2.

3. Using a serger/overlocker, ***overlock the neckline edge of the padding cup,*** using your differential feed (if you have one), to stop the edge from stretching. To prevent the edge from stretching, turn the differential feed dial to a slightly larger number. Diagram 3.

4. ***Pin each outer fabric/lace cup to its corresponding padding cup in their finished position,*** slightly stretching the outer cup over the padding cup if necessary. Ensure that the raw wire line seam raw edges of both layers of the total cup meet beautifully, and that the armhole edge of the outer cup overhangs the arm-hole edge of the padding cup by 1cm.

5. ***Stay stitch the raw edges together around the edge of each cup.*** Diagram 5.



6. If your pattern bra has the two layers of each cup ***sewn together across the neckline edge***, then sew them together in the same way. Sometimes the lace upper cup is just backstitched to the top of the padding cup at intervals. Sometimes the two layers of each cup are sewn together across the overlocked neckline edge of the padding with a line of medium straight stitches.

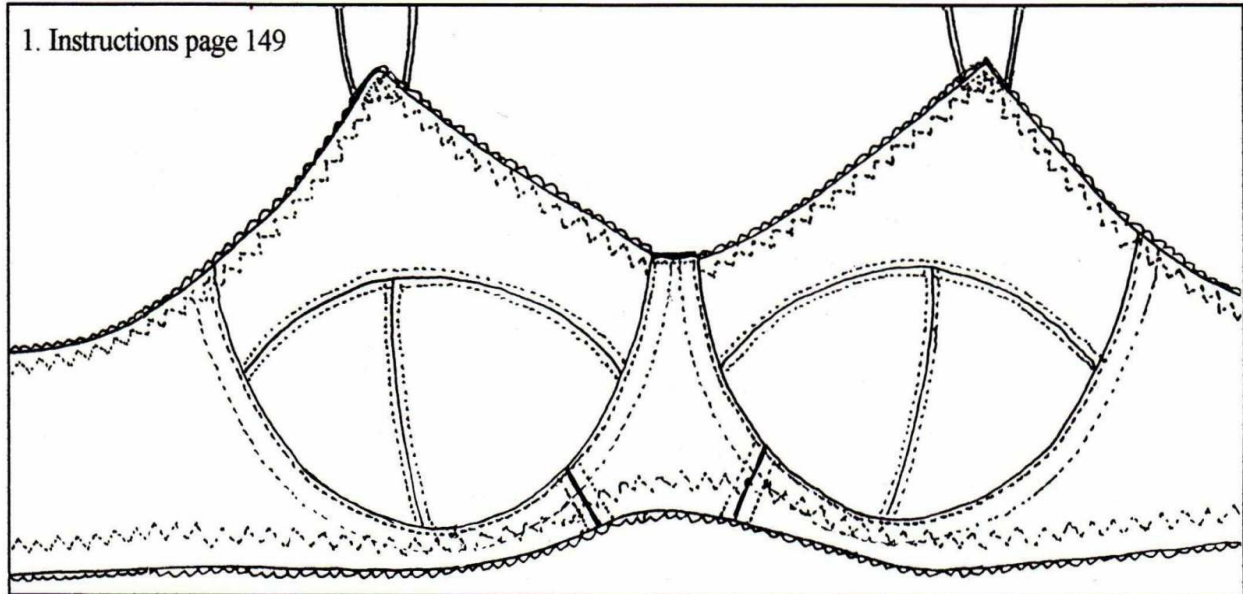
7. Sew each total cup into its cup space in the bra body which has been previously prepared. Complete the bra according to its sewing instructions (the nature of which will be determined by whether the wire line seam raw edges are turned out of the cup or into the cup: follow on from step 8 on [page 119](#) (or Alternatively from step 6 on [page 133](#)).

[page 147]

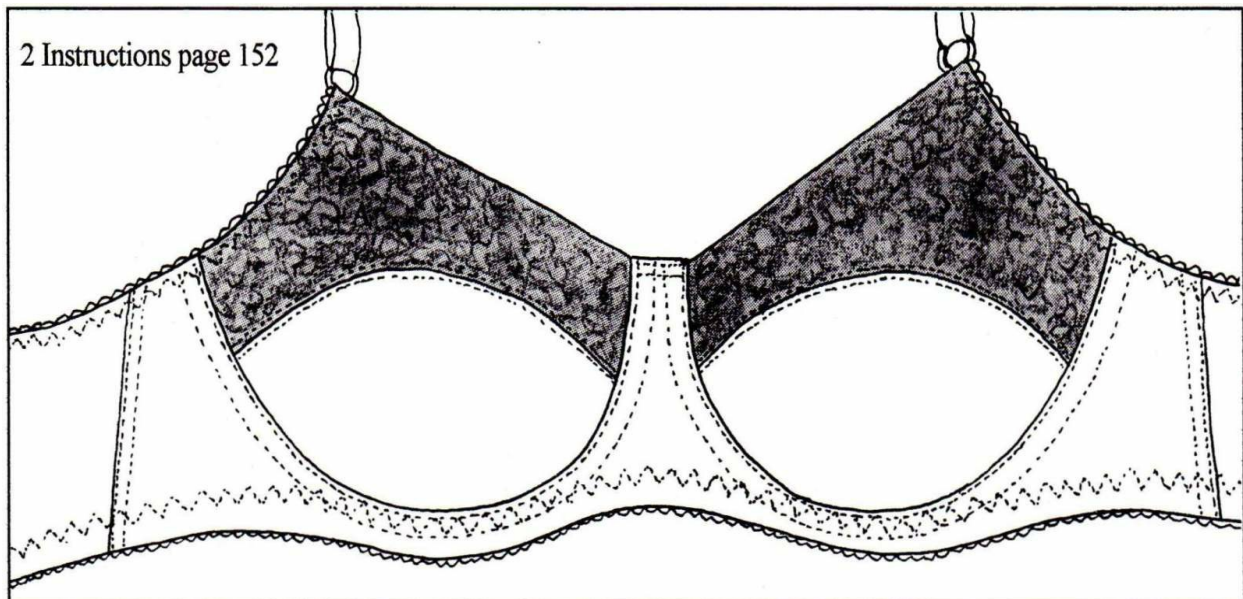
## SPECIFIC SEWING INSTRUCTIONS FOR SIX INDERWIRED BRA STYLES

The following are six different styles of underwired bras. Refer to the appropriate page for each style's sewing instructions.

Instructions [page 149](#).

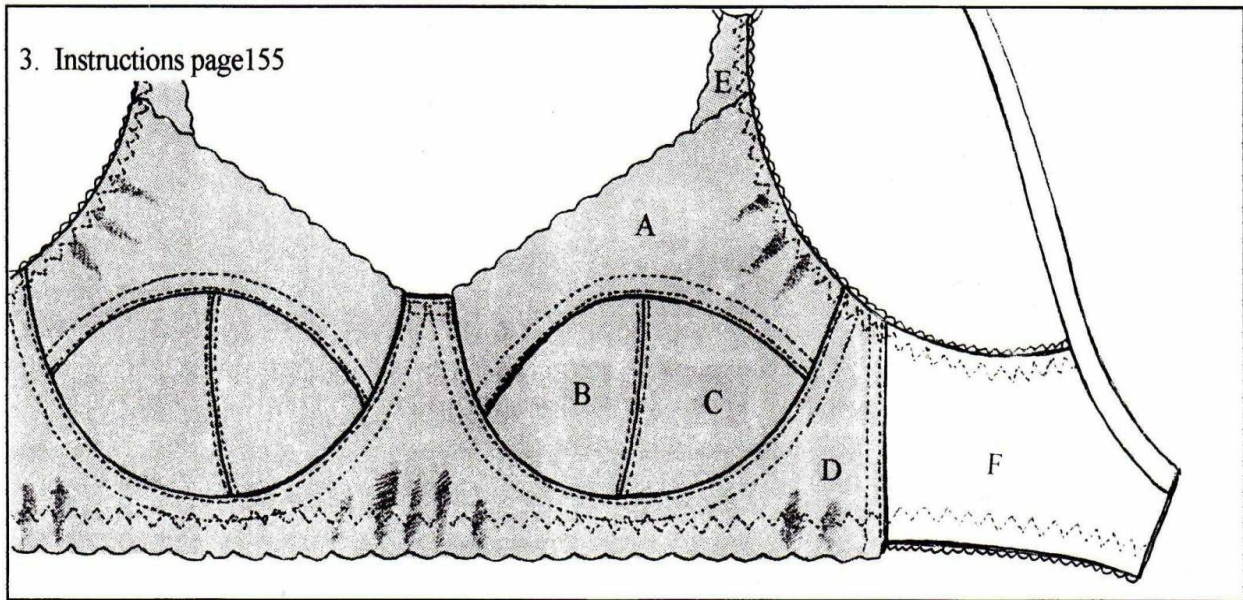


Instructions [page 152](#).



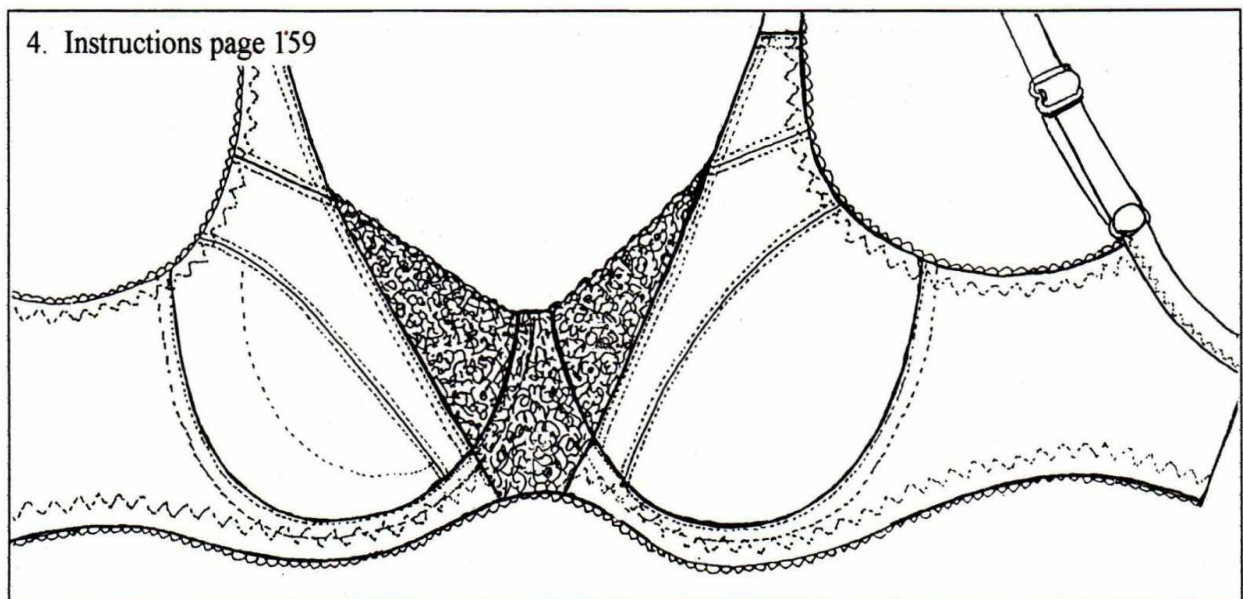
Instructions [page 155](#).





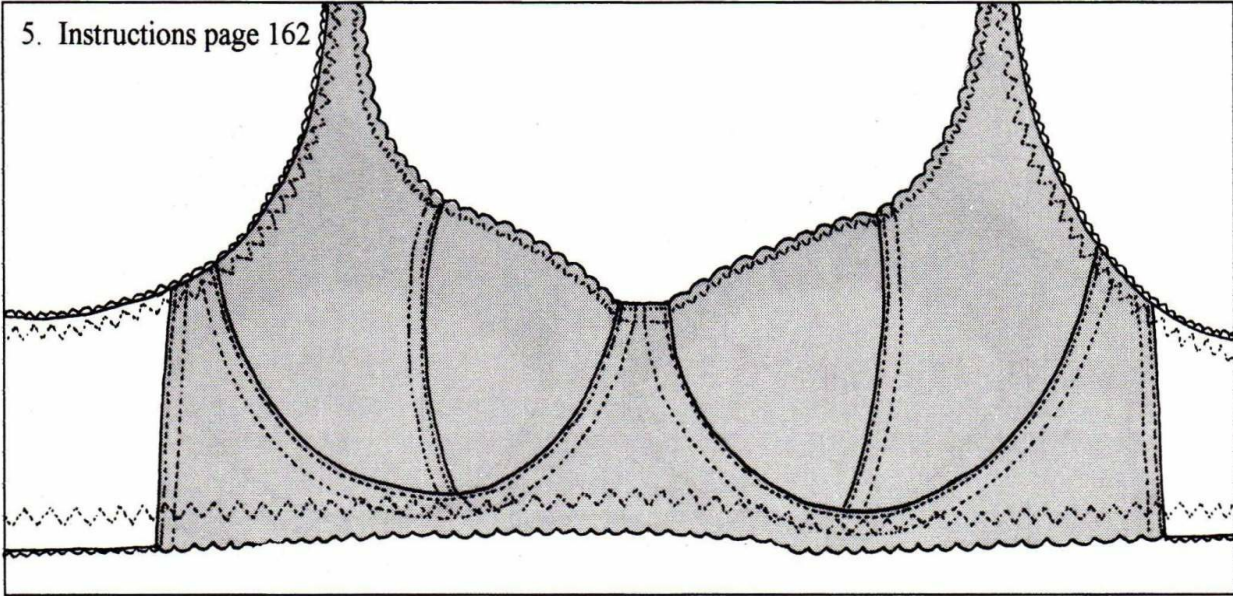
[page 148]

Instructions [page 159](#).



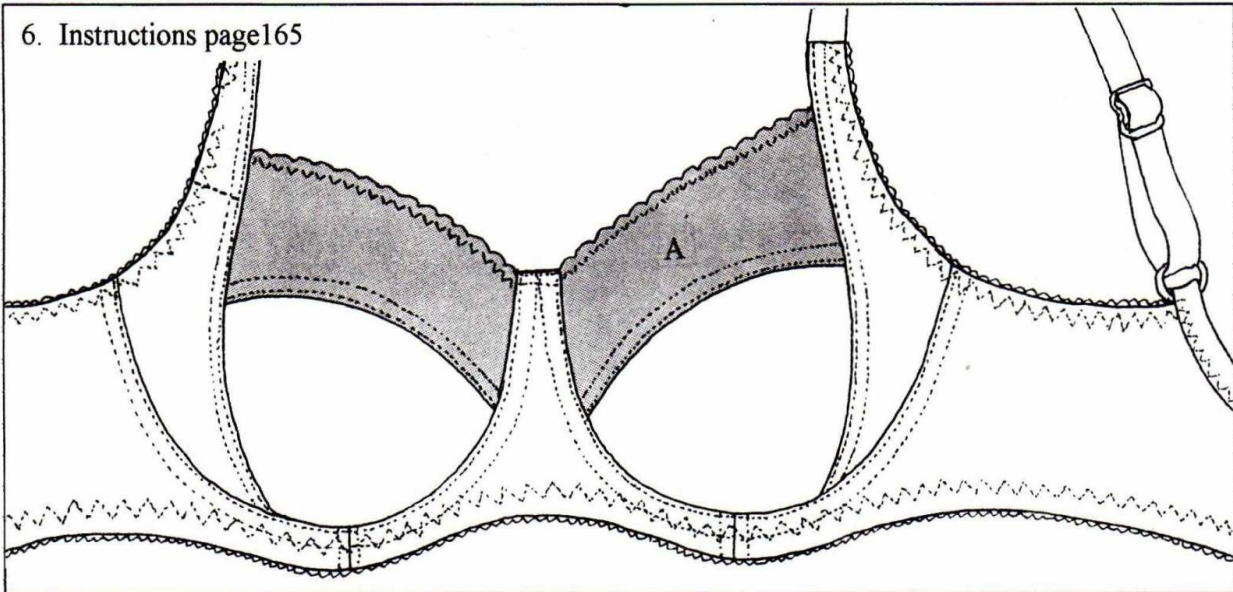
Instructions [page 162](#).

5. Instructions page 162



Instructions [page 165](#).

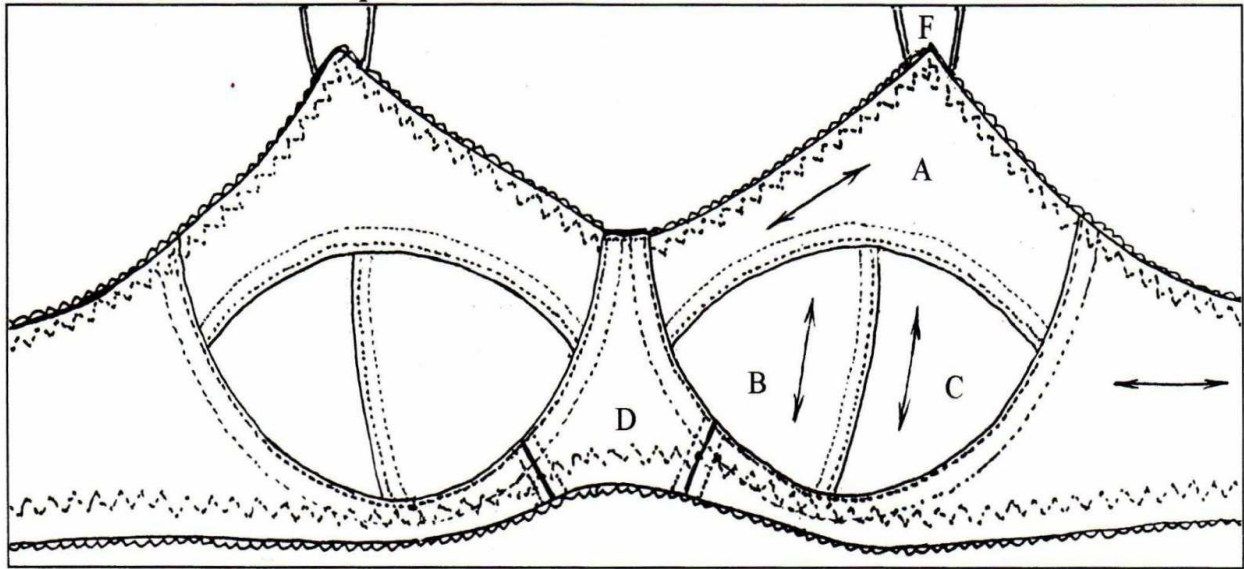
6. Instructions page 165



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**UNDERWIRED BRA - Example 1**





This is a very basic underwired bra, and although its sewing instructions are given here, for more detailed instructions, refer to the general sewing instructions for an underwired bra that begin on [page 114](#).

This bra has rigid bonded lace cups (a fine non-stretch lace is bonded to rigid stabiliser). It contains a slight one-way give that is indicated on the style diagram by arrows.

- A. Upper cup - bonded lace (non-stretch)
- B. Inner Lower-cup - bonded lace (non-stretch)
- C. Outer Lower-cup - bonded lace (non-stretch)
- D. Centrepiece - bonded lace (non-stretch)
- E. Bra Back - spandex or powernet
- F. Fabric Strap Piece - Lace fused to Padding

### 1. **Reinforce the top edge of the Centrepiece.**

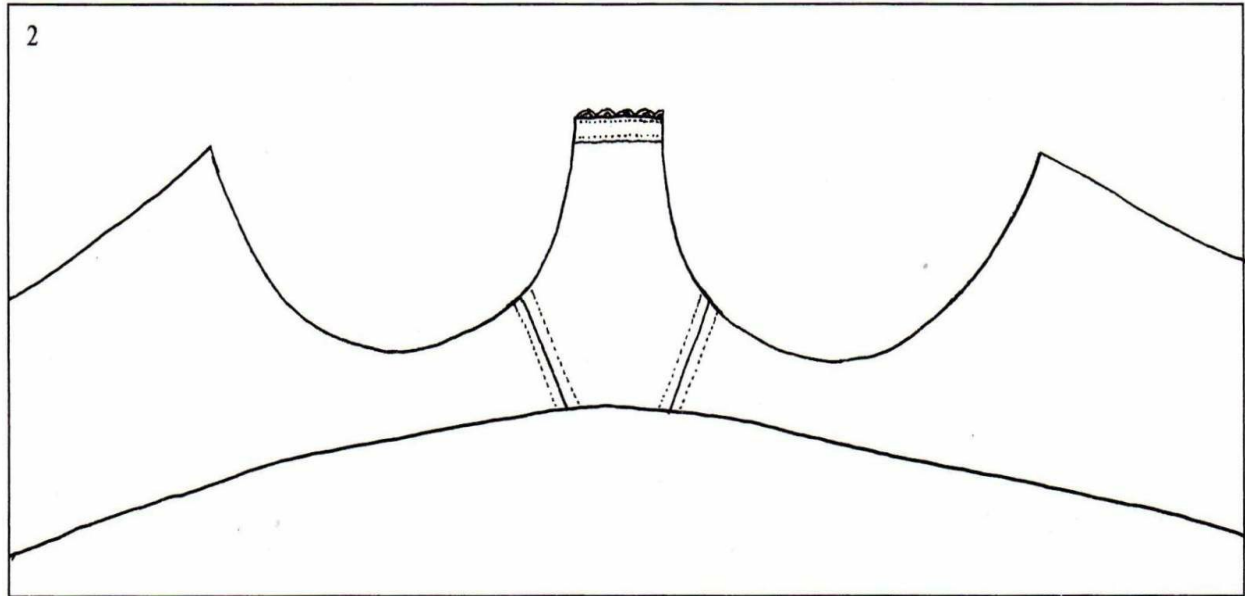
Trim the seam allowance off the top of the centrepiece. Edge stitch pre-shrunk cotton tape to the inside of the edge, and edge stitch fine, narrow edging lace to the other side of the edge.

### 2. **Seam the Centrepiece to the Bra Back.**

Using an exact seam allowance, seam the centrepiece to the bra back pieces. Ensure that at the top and bottom of this little seam, the raw edges meet exactly so that when the raw edges of the seam are parted, the two pieces are joined beautifully. Part the seam allowances and top stitch them



using a straight stitch. Trim the raw edges back to the top stitching. Diagram 2. The bra body is now complete, and it can be put aside while the cups are assembled.

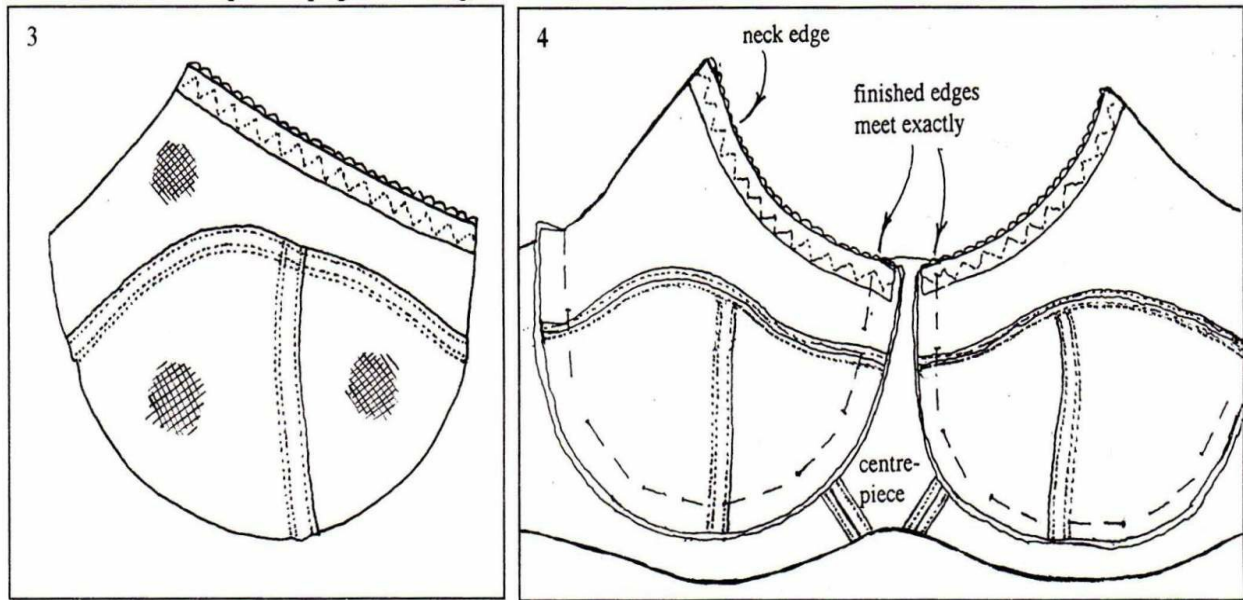


[page 150]

### 3. *Assemble the Cups.*

Using a straight stitch and an exact seam allowance, **sew the central lower-cup seam** that joins pieces B and C. Trim back B's raw edge. Turn both raw edges towards the centre of the bra and pin stitch and top stitch as shown. Trim back raw fabric edge to the top stitching. **Apply easing stitch** to the mid cup seam line as marked on the pattern pieces and pull the bobbin thread slightly taut. Making sure centre and side markings match up **sew the central cup seam** that joins the combined lower cups to the upper cups (joins B & C to A) Trim back A's raw edge. Turn both raw edges upwards and pin stitch and top stitch as shown.

Apply unstretched narrow scalloped elastic or stretch piping to the neckline edge of each upper-cup Refer to the technique on [page 97](#). Diagram 3.



#### **4. Seam the Cups into the Bra body**

The wire line edge of the bra body may need to be slightly stretched to accommodate the deep, rounded shape of the cup. Pin from the centre of the bra outwards towards the side of the bra, making sure that the neckline finished edges of the cup and centrepiece meet each other exactly. When you have finished pinning each cup in, turn your bra so that the right side is facing you. Does the neckline edge of the upper-cup exactly meet the top edge of the centrepiece? Have you pinned each cup in correct position? i.e. (is the right breast cup in the right breast cup space?) Where is the armhole edge of the cups?

When you are satisfied that you have pinned your cups into the bra body correctly, sew them in using medium length straight-stitches, taking care to sew them in slowly and carefully so that there are no puckers in either the cup fabric or the bra body. To minimise the risk of puckers forming, try to keep the underneath fabric as flat as possible as you sew. Diagram 4.

#### **5. Sew wide scalloped elastic around the lower edge of the bra.**

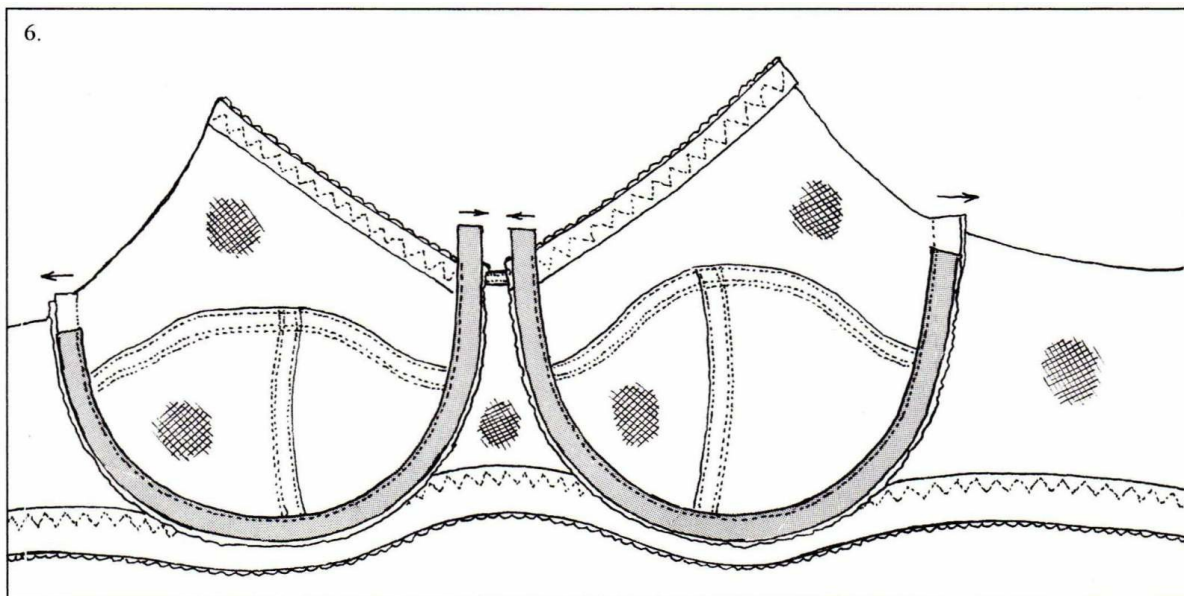
Refer to the technique on [page 97](#), and the specific instructions in step 8 on [pages 119-121](#). When sewing the first line of stitching (the medium zig zag next to the scalloped edge) make sure the elastic is positioned so that there is just enough fabric underneath the 'wire line' seam to allow the wider elastic to be turned upwards and top stitched using a wide 3-step zig zag. When top stitching this elastic, make sure your second line of sewing is very

close to the straight edge of the elastic, so that there is no opportunity for the elastic to fold over or roll when the bra is worn.

**6. Sew the Underwire Casing to the raw edges around the cups, insert the underwires and complete the armhole edge with narrow edging elastic.**

Carefully follow the instructions on [pages 121-126](#) (steps 9-15). When sewing the casing to the seam allowance be careful to slightly stretch the raw edges, sewing the casing to the **cup** side of the raw edges. The raw edges and the casing sewn to them will be turned out of the cups and top stitched to the bra body. Before sewing on the casing ask yourself, 'Will the casing conceal the raw edges when the raw edges are turned out of the cup?' Diagram 6.

\* Note that the end of the underwire casing can be cut 1cm underneath the raw of the armhole edge so that the armhole edge elastic will be initially stitched through the fabric alone. The elastic will then be folded over the end of the casing to be top stitched down with a 3-step zig zag.



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**7. Assemble the Padded Fabric Straps**

The elastic will be then When drafting the pattern of your padded strap, do not add a seam allowance to each side of the strap (along the inner, neckline edge and the armhole edge). Ensure that the neckline edge of the strap, and the end that joins to the upper cup are clearly marked (the shape of these

straps is often asymmetrical). Using fusible webbing, fuse a lining fabric to the under-side of the padding. Also fuse lace or fabric to the top surface of the padding. The padded straps are to be cut out singly. Trace the outside edge of your strap pattern onto the top side of a single layer of the padding using a water-soluble marking pen. The pattern piece will have to be traced right-side up and then the pattern piece should be flipped over so that its mirror image can be traced for the other strap. Remove the pattern piece. Using a straight stitch on your machine, stay stitch just inside the line you have drawn. Using a sharp pair of scissors cut each strap out, cutting exactly on the drawn line (just outside the line of stitching). This stitching line will compress the padding around the very outside edge of the strap, making it easier to bind the edges with bias binding.

***Bind the side edges of each padded strap with narrow bias binding or satin bias binding.***

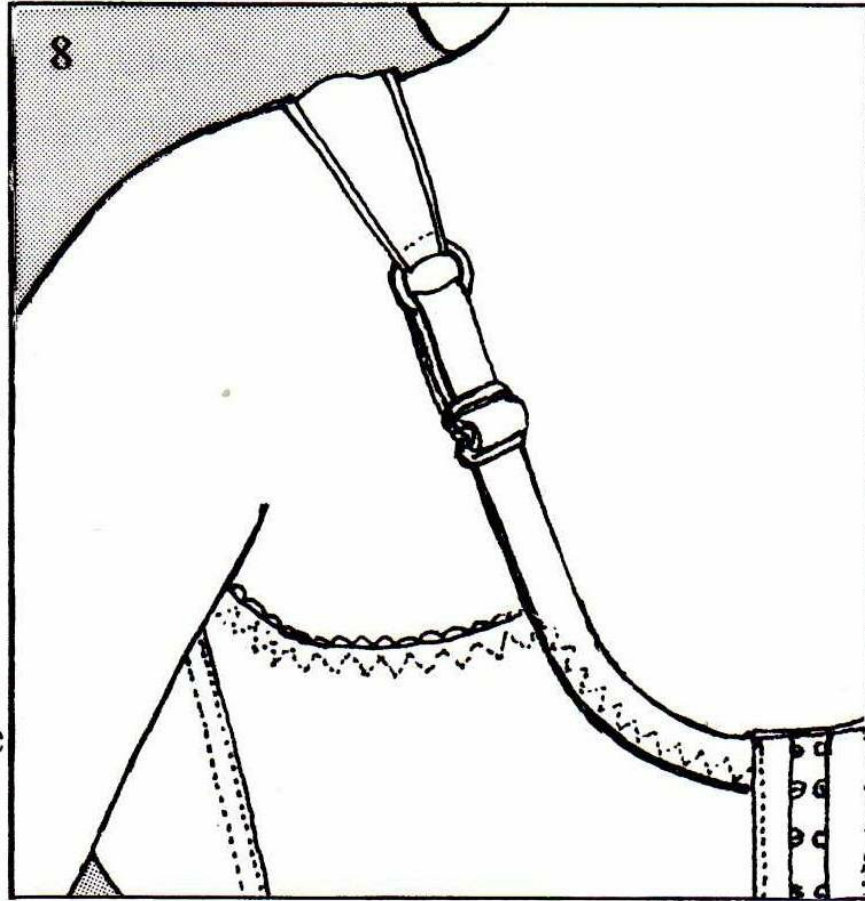
***Sew each padded strap securely to the top point of each cup,*** ensuring that the strap comes off the top point of the cup at the correct angle.

***Stitch a ring securely to the back-end of the padded strap.***

#### ***8. Assemble the straps.***

Cut two lengths of strap elastic according to the length of the straps on your pattern bra. Although the adjustable portion of the strap is positioned on the back of the body when this bra is worn, it is technically a front adjusting bra strap. This is because the ring is sewn to the padded strap rather than the bra back. It will help if you consider the padded strap to be just an extension of the top of the cup (an extension of the front of the bra).

Assemble the straps according to the instructions on [page 105](#).



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**9. Sew the strap to the bra back.**

Refer to the detailed instructions on [pages 106](#) and [107](#). After positioning the end of the strap to make sure it correlates exactly to the vertical height of the hook/eye tab that is to be sewn along the centre back raw edge, stitch the completed strap to the edge leading down to the centre back edge. Trim the excess fabric from behind the top-edge of the strap.

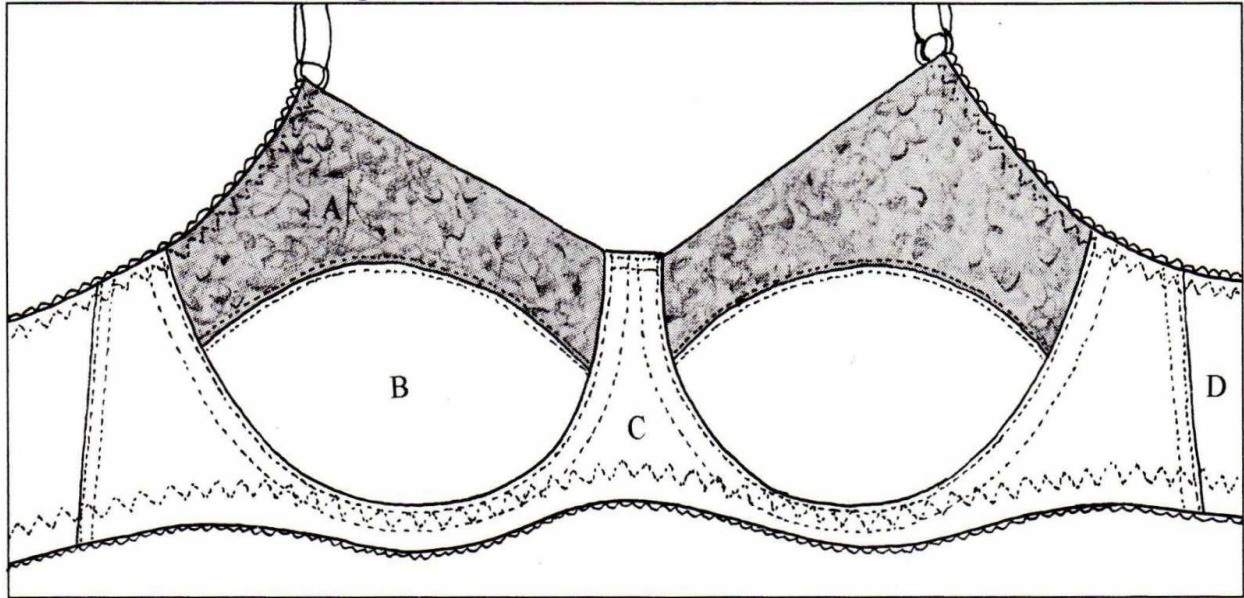
**10. Sew the hook and eye tabs to the bra back.**

Refer to the detailed instructions on [pages 108-111](#).

**11. Sew a bow to the centre front of the bra.**

**UNDERWIRED BRA - Example 2**





This is a very basic underwired bra, and although its sewing instructions are given here, for more detailed instructions, refer to the general sewing instructions for an underwired bra that begin on [page 114](#).

This bra has rigid cups (an upper cup made of fine non-stretch lace bonded to rigid stabiliser and a lower cup made of double-knit tricot that is bonded to rigid stabiliser). The extended centrepiece is made of double-knit tricot that is bonded to rigid stabiliser. It contains a slight one-way give that is indicated on the style diagram by arrows.

- A. Upper cup - bonded lace (non-stretch)
- B. Lower cup - bonded double-knit tricot (non-stretch)
- C. Extended Centrepiece - bonded double-knit tricot (non-stretch)
- D. Bra Back - spandex or powernet

### **1. Reinforce the top edge of the Centrepiece.**

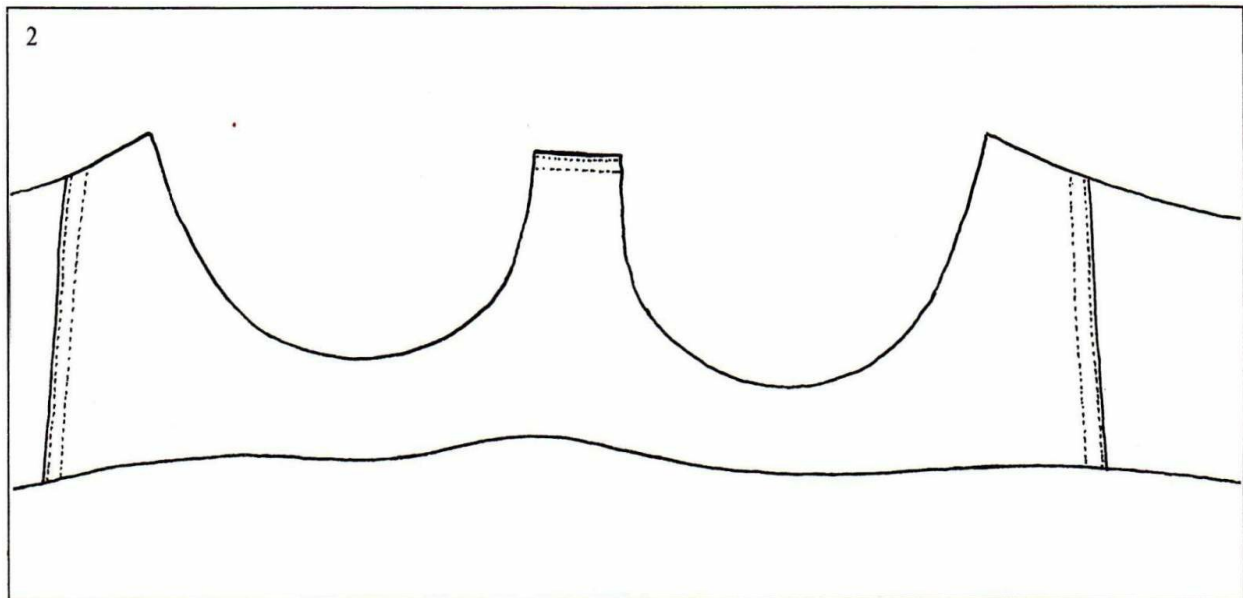
Trim the seam allowance off the top of the centrepiece. Edge stitch pre-shrunk cotton tape to the inside of the edge, and edge stitch fine, narrow edging lace to the other side of the edge.

### **2. Seam the Centrepiece to the Bra Back.**

Again, using an exact seam allowance, seam the centrepiece to the bra back pieces along the side seams. Trim back the raw edge belonging to the centrepiece, turn both raw edges towards the centre front and pin stitch and top stitch as shown. Diagram 2. The bra body is now complete, and it



can be put aside while the cups are assembled.



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### 3. Assemble the Cups.

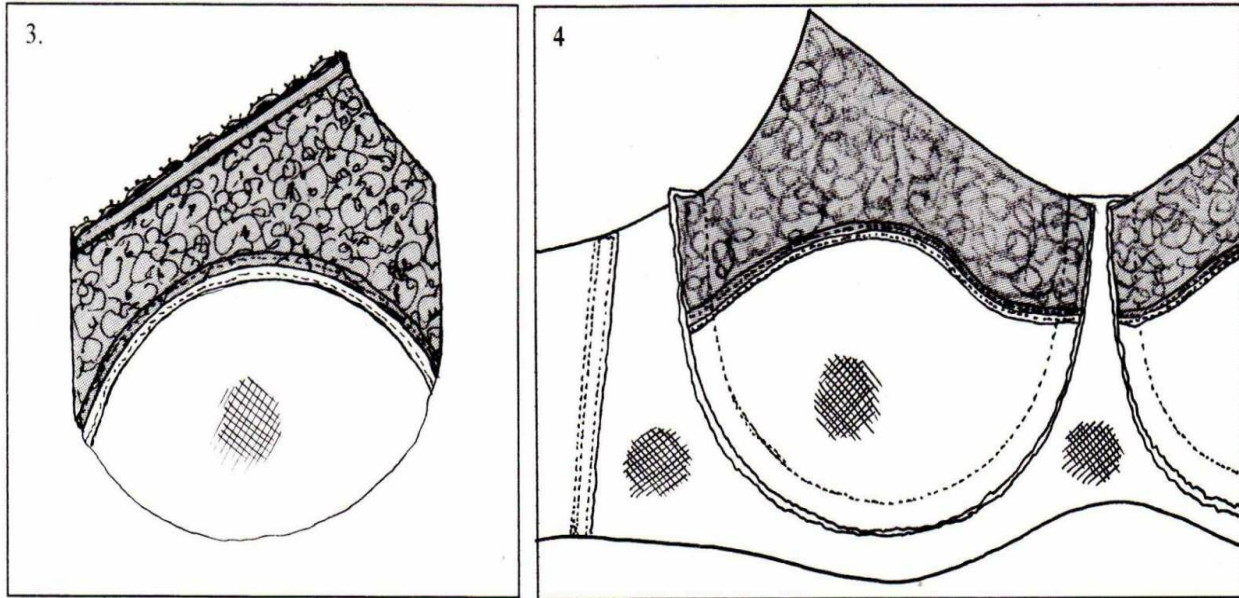
**Complete the neckline edge of each upper cup.** Edge stitch very narrow bias binding to the inside of the finished neckline edge and edge stitch narrow lace to the right side of the finished neckline edge. Trim the ends of the bias binding and the lace so that they are level with the bonded lace.

**Apply easing stitch** to the mid cup seam line as marked on both upper and lower cup pattern pieces and pull the bobbin thread slightly taut.

Making sure centre and side markings match, **sew the central cup seam** that joins the lower cups to their respective upper cups (join A to B). Part the raw edges and top stitch them extremely close to the seam line. Carefully trim back the raw edges right back to the lines of top stitching. Using either trimmed bias binding, pre-shrunk cotton tape or a strip of interlock, cover these raw edges (refer to [page 92](#)).

**Sew a line of stay stitching** (very long straight stitches) right on the position of the seam line around the cup. If necessary, this line of stitching can be used as easing stitching to slightly contract the wire line edge of the cup so that it is a little easier to insert the cup into the bra body's cup space.

Diagram 3.



#### **4. Seam the Cups into the Bra body 4**

The wire line edge of the bra body may need to be slightly stretched to accommodate the deep, rounded shape of the cup. Pin from the centre of the bra outwards towards the side of the bra, making sure that the neckline finished edges of the cup and centrepiece meet each other exactly. When you have finished pinning each cup in, turn your bra so that the right side is facing you. Does the neckline edge of the upper-cup exactly meet the top edge of the centrepiece? Have you pinned each cup in correct position? i.e. (is the right breast cup in the right breast cup space?) 'Where is the armhole edge of the cups?'

When you are satisfied that you have pinned your cups into the bra body correctly, sew them in using medium length straight-stitches, taking care to sew them in slowly and carefully so that there are no puckers in either the cup fabric or the bra body. To minimise the risk of puckers forming, try to keep the underneath fabric as flat as possible as you sew. Diagram 4.

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#### **5. Sew wide scalloped elastic around the lower edge of the bra.**

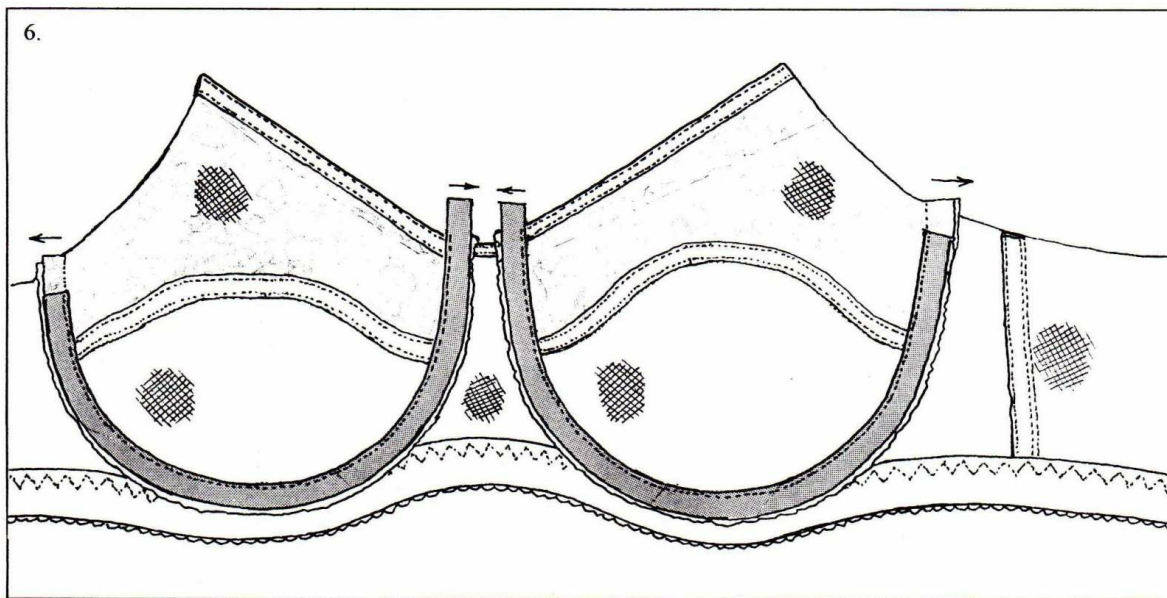
Refer to the technique on [page 97](#), and the specific instructions in step 8 on [pages 119-121](#). When sewing the first line of stitching (the medium zig zag next to the scalloped edge) make sure the elastic is positioned so that there is just enough fabric underneath the 'wire line' seam to allow the wider

elastic to be turned upwards and top stitched using a wide 3-step zig zag. When top stitching this elastic, make sure your second line of sewing is very close to the straight edge of the elastic, so that there is no opportunity for the elastic to fold over or roll when the bra is worn.

**6. Sew the Underwire Casing to the raw edges around the cups, insert the underwires and complete the armhole edge with narrow edging elastic.**

Carefully follow the instructions on [pages 121-126](#) (steps 9-15). When sewing the casing to the seam allowance be careful to slightly stretch the raw edges, sewing the casing to the cup side of the raw edges. The raw edges and the casing sewn to them will be turned out of the cups and top stitched to the bra body. Before sewing on the casing ask yourself, 'Will the casing conceal the raw edges when the raw edges are turned out of the cup?' Diagram 6.

\* Note that the end of the underwire casing can be cut 1cm underneath the raw of the armhole edge so that the armhole edge elastic will be initially stitched through the fabric alone. The elastic will be then folded over the end of the casing to be top stitched with a 3-step zig zag.



**7. Elasticise the total underarm edge.**

Reinforce the end of the scalloped elastic overhang that is to be threaded through the ring (refer to [page 101](#)) and then complete the total underarm edge.

**8. Sew the ring to the upper cup.**

Thread the reinforced elastic overhang through the ling and sew the end of the elastic securely to the underside of the cup.

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**9. Assemble the straps.**

Follow the instructions on [page 105](#).

**10. Sew the strap to the bra back.**

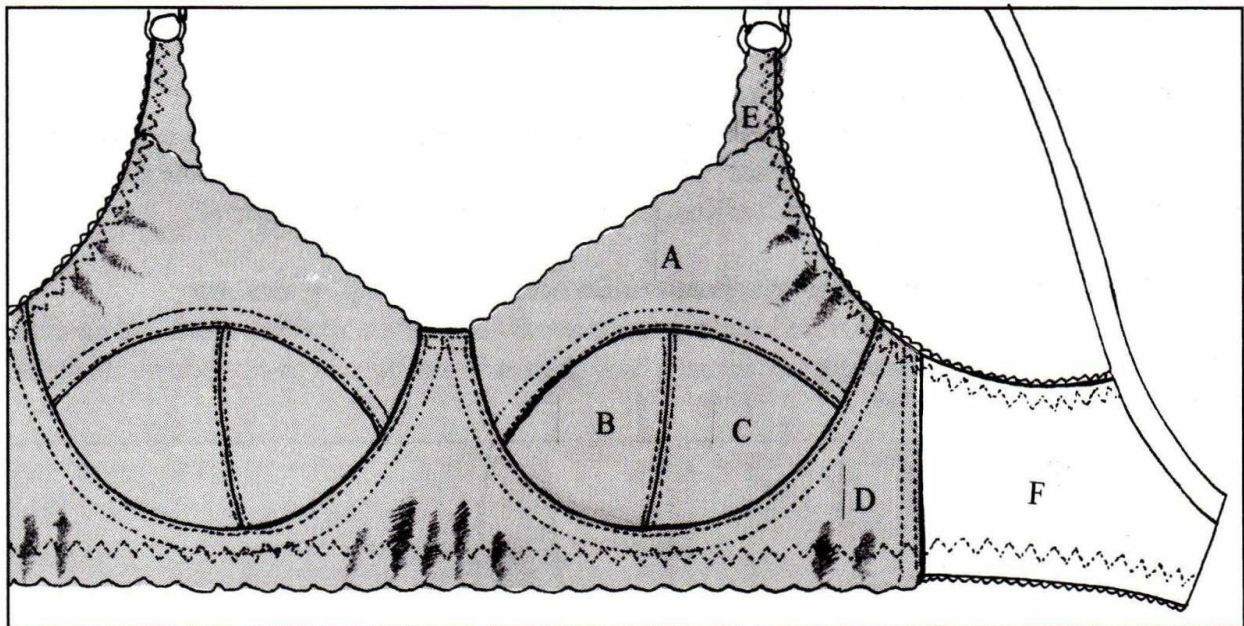
Refer to the detailed instructions on [pages 106](#) and [107](#). After positioning the end of the strap to make sure it correlates exactly to the vertical height of the hook/eye tab that is to be sewn along the centre back raw edge, stitch the completed strap to the edge leading down to the centre back edge. Trim the excess fabric from behind the top-edge of the strap.

**11. Sew the hook and eye tabs to the bra back.**

Refer to the detailed instructions on [pages 108-111](#).

**12. Sew a bow to the centre front of the bra.**

**UNDERWIRED BRA - Example 3**



Although its sewing instructions for this bra are given here, for more detailed instructions, refer to the general sewing instructions for an



underwired bra that begin on [page 114](#).

This bra has unlined, non-stretch lace cups. The non-stretch lace should not be too rigid, but should contain a slight one way give as indicated by the arrows on the above diagram. There is a lace strap piece that is sewn to the upper cup. The extended centrepiece is made of self-edged lace that is bonded to rigid stabiliser. The scalloped edge of the lace on the extended centrepiece provides a pretty lace overhang across the lower edge of the bra front. It contains a slight one-way give that is indicated on the style diagram by arrows.

- A. Upper cup - unlined self-edged non-stretch lace
- B. Inner Lower cup - unlined non-stretch lace
- C. Outer Lower cup - unlined non-stretch lace
- D. Extended Centrepiece - unlined self-edged non-stretch lace fused to rigid stabilizer
- E. Lace Strap Piece - unlined self-edged non-stretch lace
- F. Back - spandex or powernet

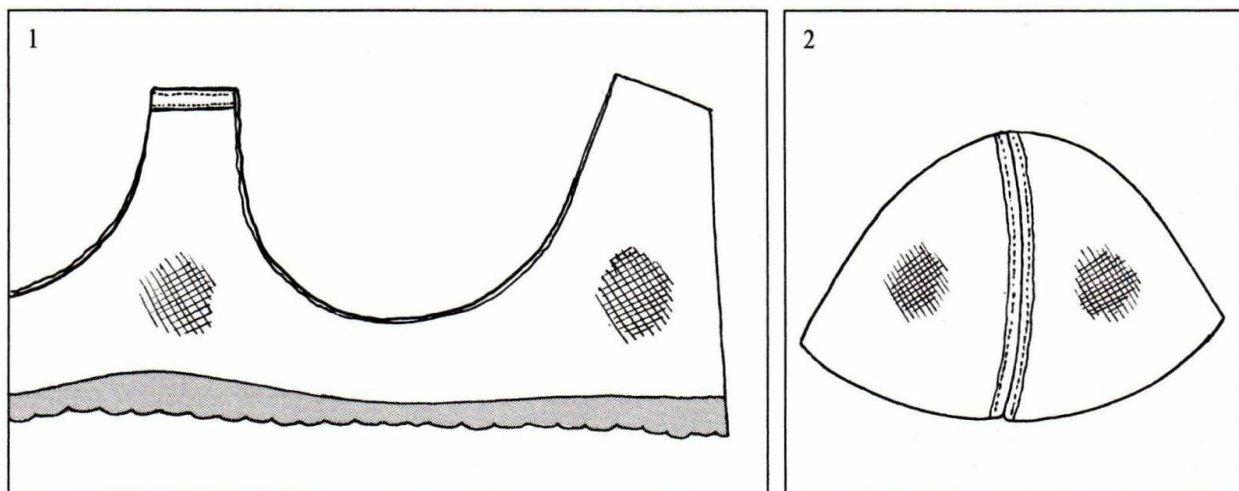
[page 156]

***1. Fuse the two layers of the centrepiece together and reinforce the top edge of the centrepiece.***

Using fusible webbing (cut out exactly the same shape and size of the rigid stabiliser lining of the extended centrepiece), fuse the rigid stabiliser to the underside of the lace. The lower raw edge of the rigid stabiliser will not quite come to the base of the scallops of the lower edge of the lace. This raw edge will be later covered by elastic.

Trim off any seam allowance of the top of the centrepiece (in between the cup spaces) and reinforce the edge by edge stitching narrow cotton tape to the inside of the raw edge. Diagram 1.





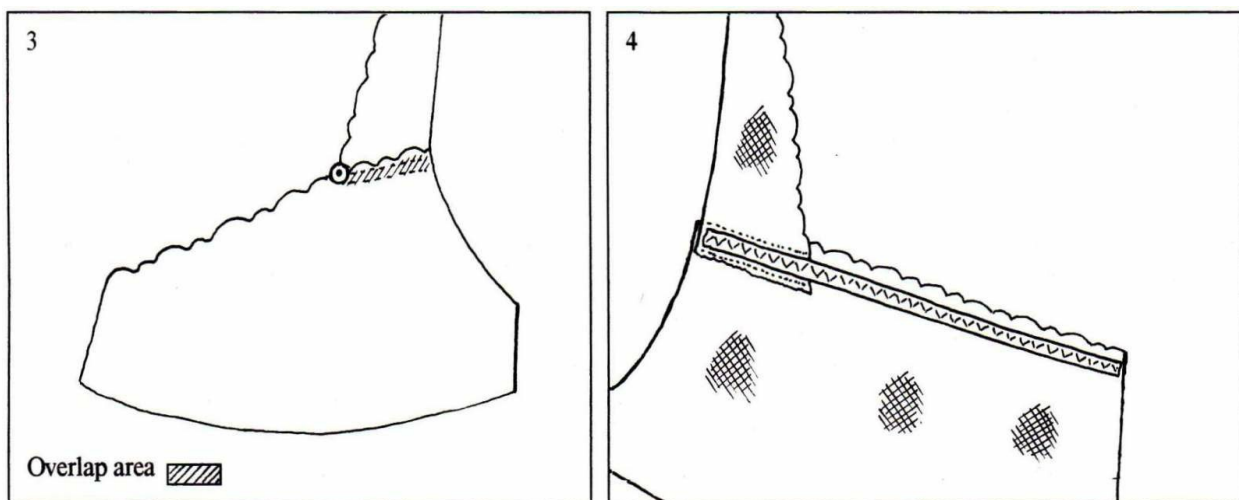


**2. Seam each outer lower cup to its respective inner lower cup.**

This is the central lower cup seam, and it should be sewn using a straight stitch and a very accurate seam allowance. Part the raw edges, one to either side of the seam and top stitch them apart very close to the seam line with a straight stitch. Very carefully trim back the raw edges to the top stitching. Diagram 2.

**3. Join each upper-cup to the lace strap-pieces and reinforce the neckline edge of each cup.**

Overlap the top scalloped edge of the upper cup over the lower raw edge of the lace strap piece, making sure that the  symbols match. Using straight sewing and a back stitch at  sew the two pieces securely along the overlapped area as shown below left.

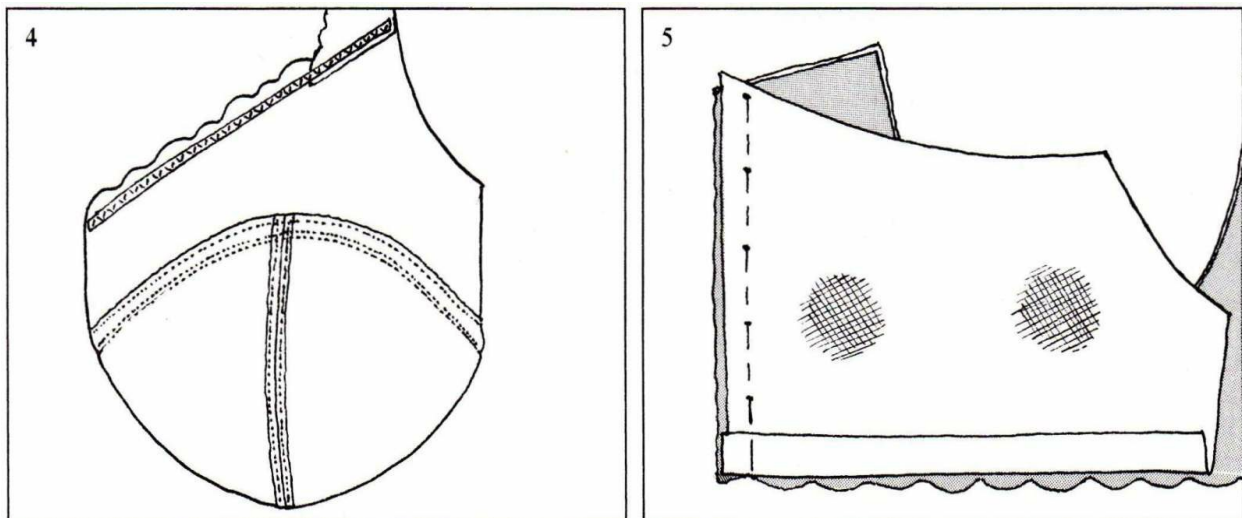


Trim half the lower raw edge of the lace strap piece back so that it is not quite so long. Place unstretched narrow 'plastic elastic' across the inside of the neckline edge of the upper cup (just under the base of the lace scallops) and zig zag the elastic to the lace in that position as shown in diagram 4. This polyurethane elastic strengthens and protects the lace edge. If the texture of plastic elastic along the neckline edge is not desired, a piece of narrow bias binding or narrow scalloped elastic can be substituted for the plastic elastic. It is best if the neckline edge of the cup has a slight amount of give as this will prevent the neckline edge from pulling tightly across the breast and causing unsightly bulging.

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#### **4 Assemble the Cups.**

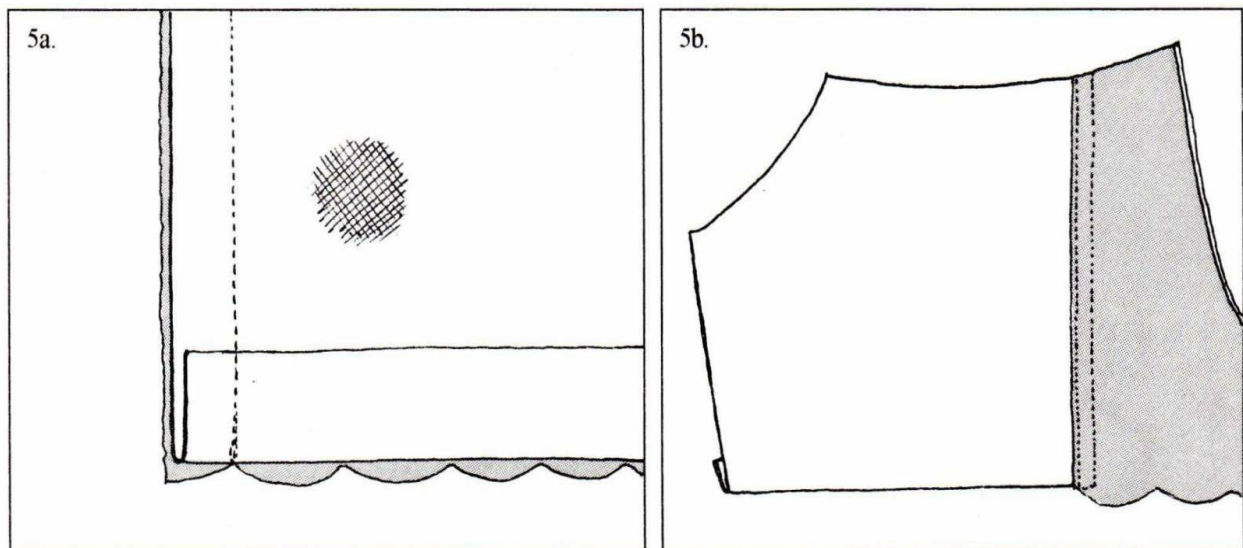
Matching centre and side markings, and making sure the top of the lower cup faces north, seam each upper cup to its corresponding lower cup. A small straight stitch with a slightly loosened upper thread tension is ideal for this main cup seam as it withstand considerable stress without pulling tightly across the breast. Trim back the upper cup's raw edge, turn both the raw edges upwards, and pin stitch and top stitch as shown. Carefully trim back any excess fabric of the lower cup's raw edge to the line of top stitching. Diagram 4.



#### **5. Seam the extended centrepiece to the bra back.**

Turn up the lower edge seam allowance on the spandex/powernet back

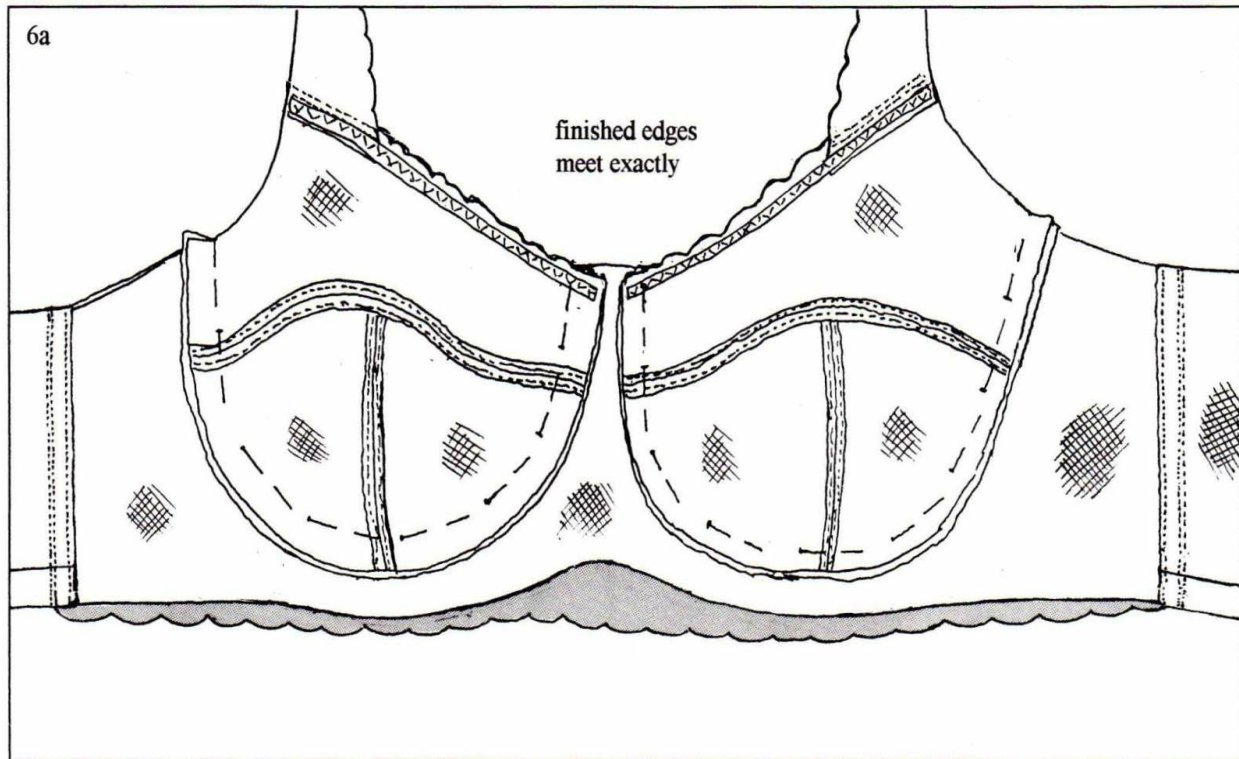
pieces (as if you were going to hem them). Press them flat with a medium iron using a pressing cloth so that at no stage is the iron's sole plate touching the spandex/power net fabric in the bra back. With right sides together, pin the side seam (pin the bra back pieces to the extended centrepiece). Make sure that the bottom edge of the lace and the finished edge of the spandex back meet exactly at the bottom of each side seam (do a back stitch at the bottom of each side seam). Diagram 5a. Trim the lace raw edge back. Turn both raw edges towards the centre front of the bra and pin stitch and top stitch as shown. Diagram 5b.



#### **6. *Seam the cups into the bra body.***

Pin each cup into its correct cup space in the bra body, making sure that the finished lace neckline edge of each cup exactly meets the finished edge of the centrepiece at the centre front, keeping the raw edges beautifully together and using an exact 1cm seam allowance.

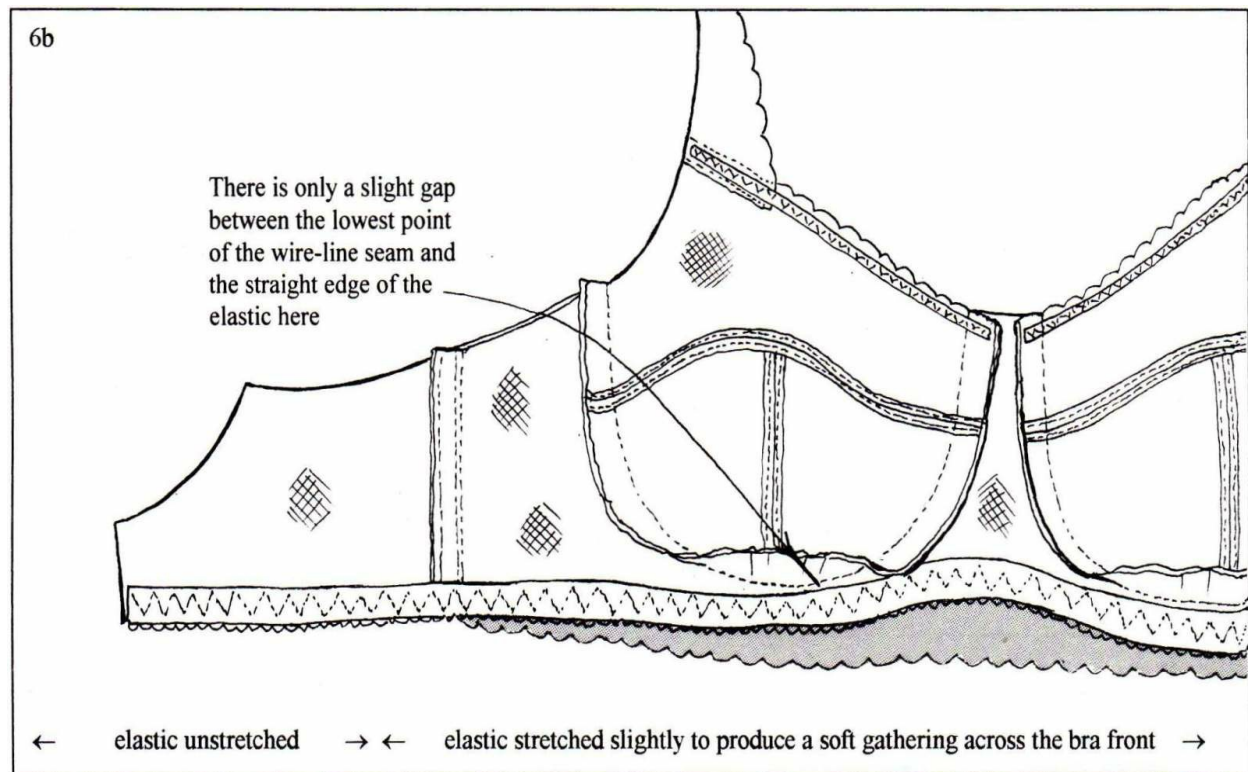
Once the cups have been sewn into their cup spaces, do not trim the wire line seam's raw edges back! Simply pin the raw edges upwards into the cup so that the lower edge elastic can be sewn to the centre piece just beneath the 'wire line' seam. Diagram 6a.



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This lower edge elastic (wide plush lingerie scalloped elastic) should be laid flat against the inside surface of the bra felt side up, so that the lower scalloped or picot edge just peeks out from underneath the folded lower spandex edge, and the raw edge of the centrepiece lining is concealed by the elastic. Diagram 6b.

To obtain a professional looking finish, I suggest you stretch the elastic slightly across the bottom of the centrepiece from side seam to side seam, but make sure that this lower edge elastic is **unstretched** across the lower edge of the bra back. Once the elastic is pinned into its correct position, sew along the centre of the elastic using the widest three-step zig zag or serpentine stitch your sewing machine will produce.

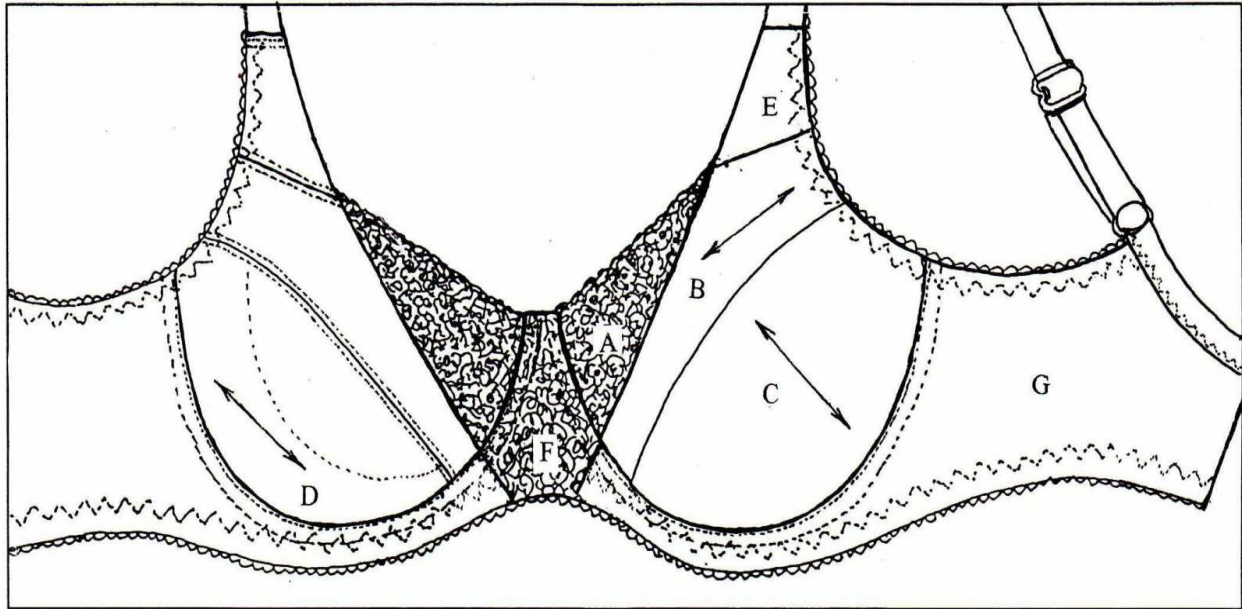


7. Sew underwire casing to the cup side of the wire line seam raw edges and complete the bra according to the instructions on [pages 121 to 127](#) (step 9 to step 19).

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#### ***UNDERWIRED BRA - Example 4***





- A. Neckline edge piece - self-edged stretch lace
- B. Middle cup piece - heavy quality nylon lycra
- C. Lower cup - heavy quality nylon lycra
- D. Lower cup support piece - heavy quality nylon lycra that is fused to the underside of the lower cup.

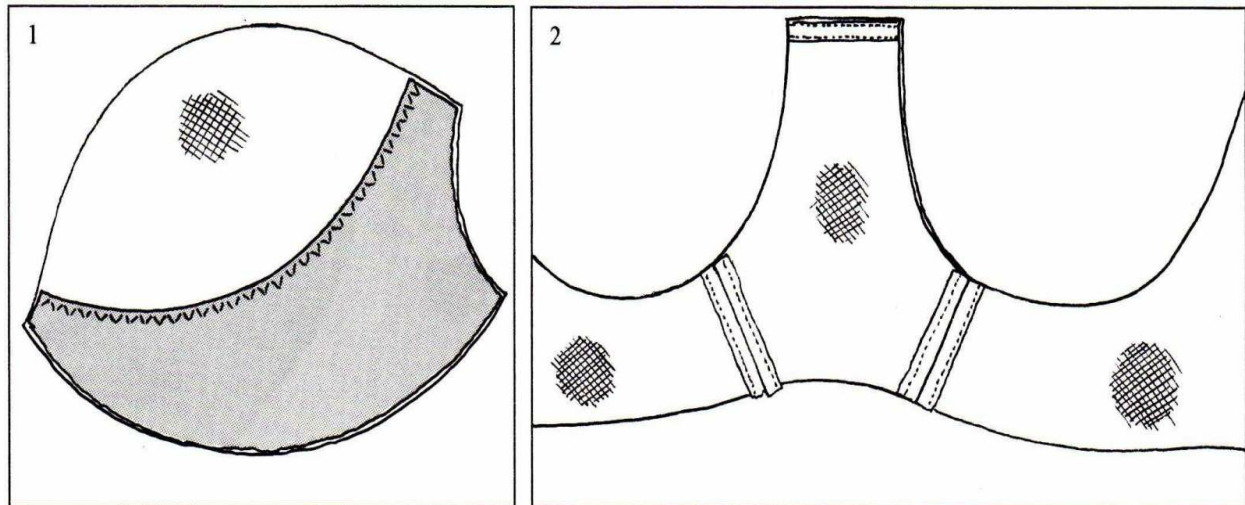
Note that the direction of greatest stretch in this support piece runs in the opposite direction to that in the lower cup. The net result of this is to effectively cancel out the stretch in the bottom of the lower cup, forcing the bulk of the breast upwards in the cup, creating more breast uplift.

- E. Fabric strap - heavy quality nylon lycra fused to rigid stabiliser lining (non-stretch)
- F. Centrepiece - stretch lace fused to a rigid stabiliser lining (non-stretch)
- G. Bra back - powernet or spandex

The cup fabric in this bra is made of a heavy quality nylon lycra or light weight spandex, It has a predominant one-way, low to medium stretch that is indicated in the various cup pieces by the arrows in the above diagram. There should be almost no stretch in the other direction.

**1. Fuse together the layers of the centrepiece, the fabric strap pieces, and the lower cups together.** Using a fusible webbing, fuse the rigid stabiliser

lining to the back of the stretch lace centrepiece and the fabric strap pieces. Using a pressing cloth to prevent the hot sole plate of the iron from touching the lower cup fabric, fuse the lower cup support piece to the underside of the lower cup in its finished position. Using a medium zig zag, stitch across the top of the lower cup support piece. This line of stitching will prevent the lower cup support piece from separating from the lower cup. Diagram 1.



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**2. Hem the top of the centrepiece and seam the centrepiece to the bra back.**

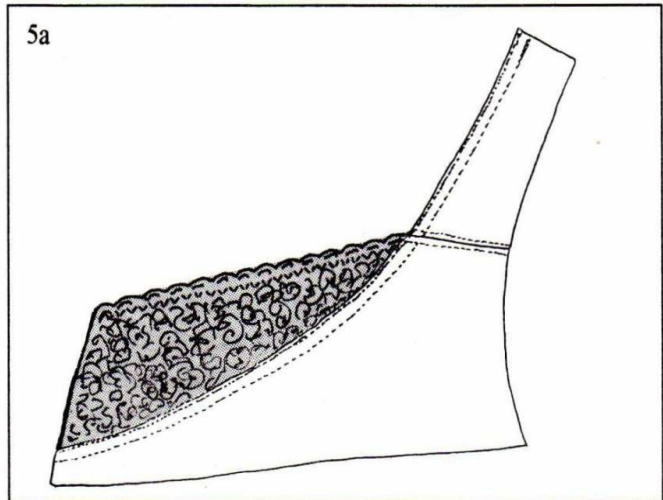
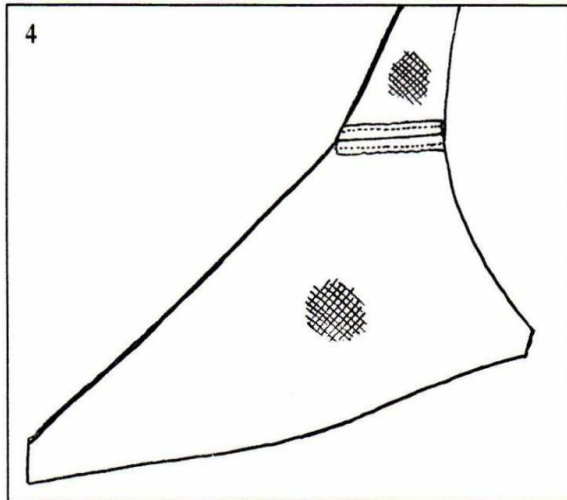
Using an exact seam allowance, hem the top of the centrepiece. Using straight stitching and an exact seam allowance seam the centrepiece to the bra back. Part the raw edges and top stitch them as shown. Diagram 2.

**3. Reinforce the stretch lace neckline edge.**

Zig zag a piece of unstretched narrow elastic or plastic elastic across the base of the scallops of the stretch lace neckline edge.


**4. Seam each middle cup piece to its corresponding fabric strap piece.**

Ensure that any alignment points match up beautifully, and that the raw edges meet exactly at the beginning and end of each seam line. Part the raw edges and top stitch them apart quite close to the seam line. Trim back the raw edges close to the lines of top stitching. Diagram 4.

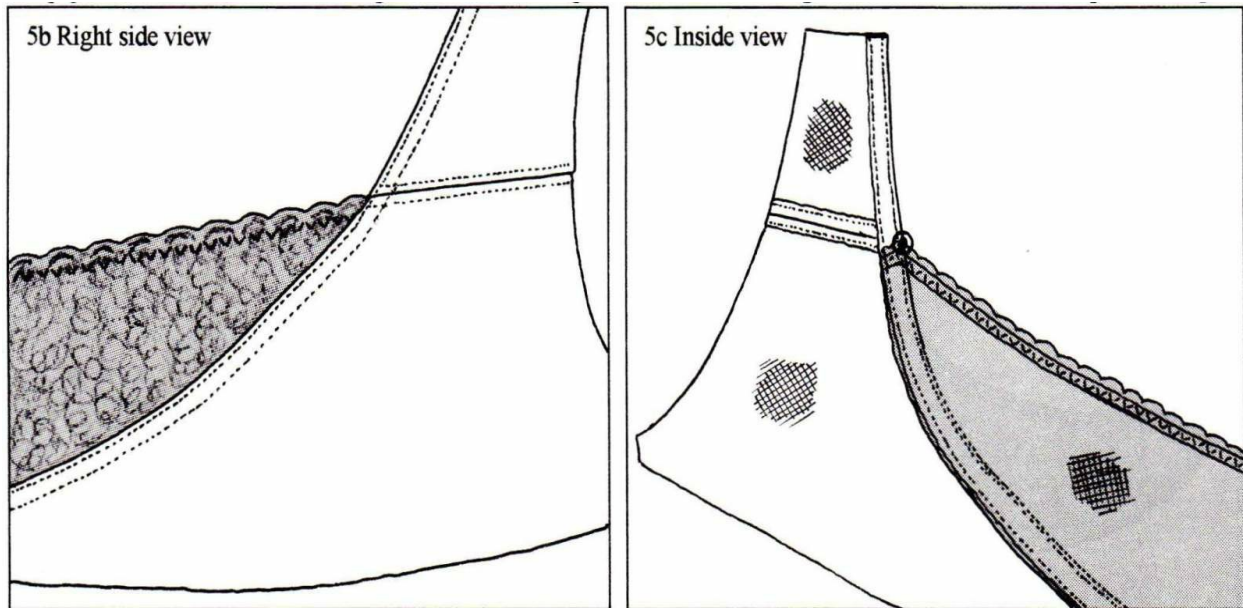


**5. Seam each stretch lace neckline edge piece to its corresponding middle cup piece fabric strap piece.**

Ensure that the top edge of the stretch lace beautifully meets the seam line that joins the middle cup piece to the fabric strap piece. Diagram 5a.

To minimise seam line bulk, trim back the raw fabric edge belonging to the middle-cup piece from  down to the centre front. This raw edge will be underneath the stretch-lace raw edge and enclosed when the two raw edges are turned downwards and top stitched.

Turn the raw edges away from the neck line edge as shown below, and pin stitch and top stitch as shown. The pin-stitching should be extremely close to the folded over fabric edge and the top stitching should be  $\frac{1}{2}$  cm or so away from it. The extension of these lines of pin-stitching and top stitching on the fabric strap piece will be its hem along the neckline edge. Trim the raw edges back to the line of top stitching.



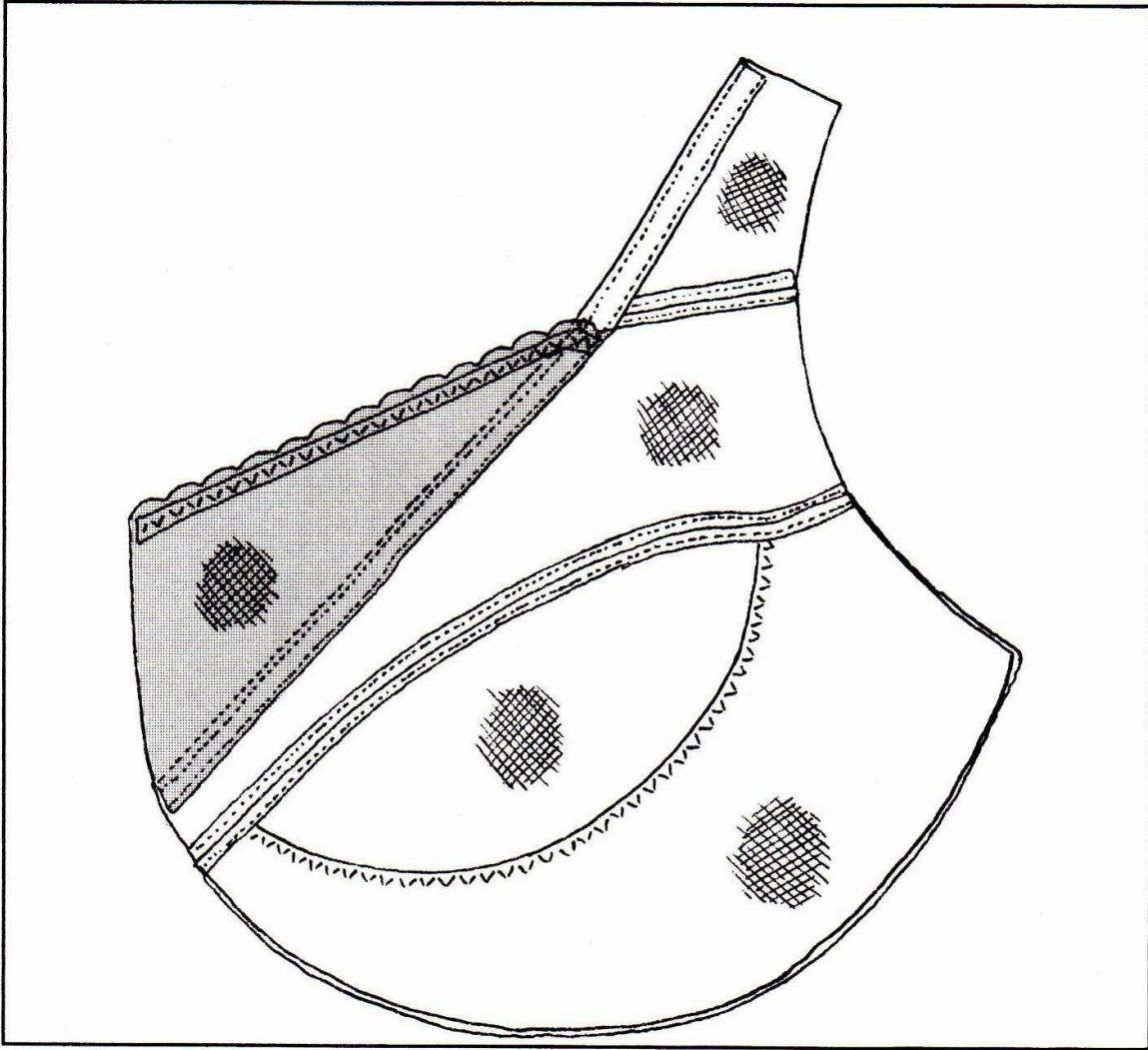
[page 161]

**6. *Apply easing stitch to the tip of the lower cup.***

Using an extremely long straight stitch positioned exactly on the seam line, sew a line of easing stitch across the mid cup seam line approximately in the nipple area. Pull the bobbin thread up slightly taut so that this piece of fabric will no longer lie flat on a surface, but 'cups' slightly at the top.

**7. *Seam the lower cup to its corresponding upper cup section.***

To sew this seam, use an exact seam allowance and a small straight stitch, but loosen the upper thread tension slightly. Part the raw edges of this seam and top stitch them apart fairly close to the seam line. Carefully trim back the raw edges to the lines of top stitching.

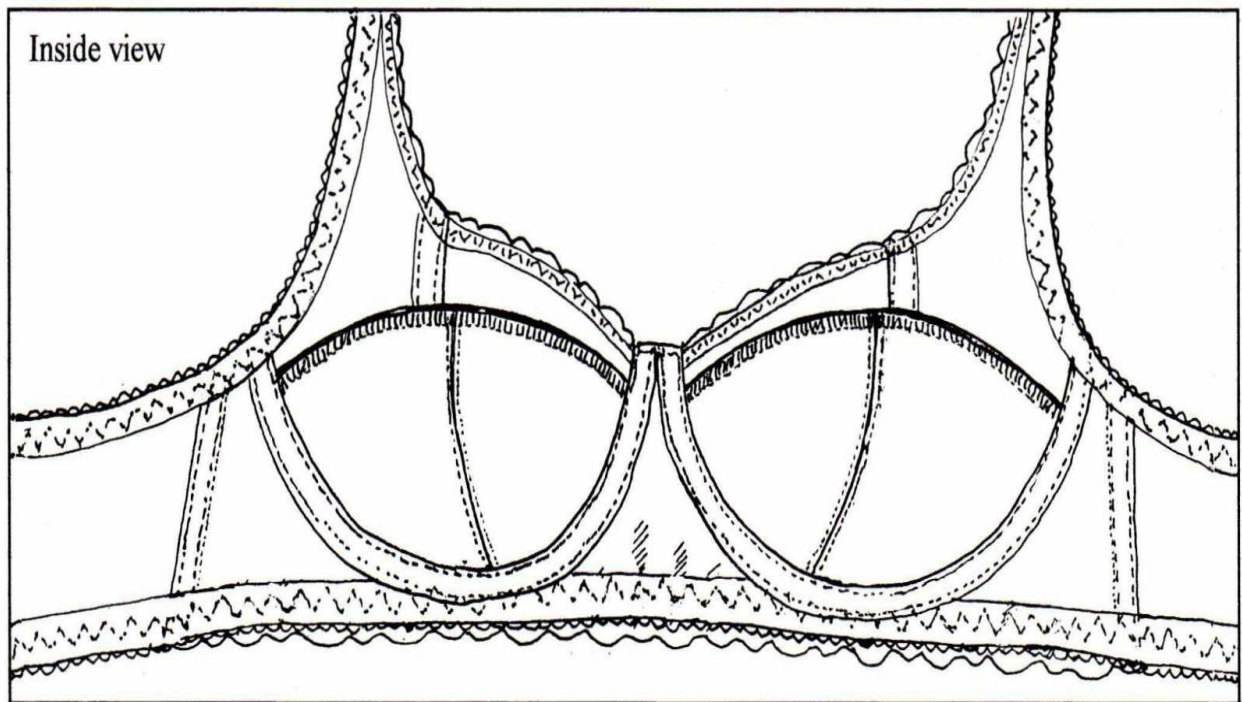
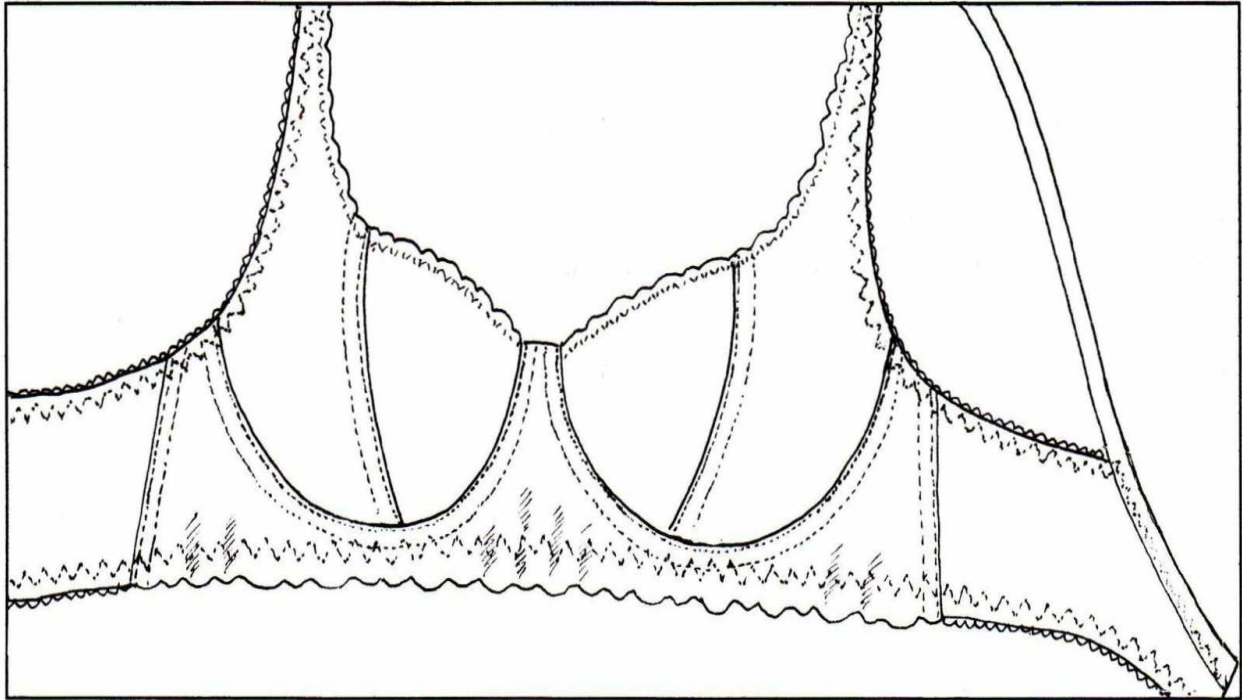


The cups are now assembled, and this bra can be completed according to the instructions on [pages 118 to 127](#) (steps 7 to 19). Keep in mind that this bra has back adjusting straps, so when elasticising the armhole edges, ensure that the finished width of the top of each fabric strap exactly matches the width of the strap elastic to be used. When sewing rings to the bra back follow the instructions on [pages 102 and 103](#).

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### ***UNDERWIRED BRA - Example 5***





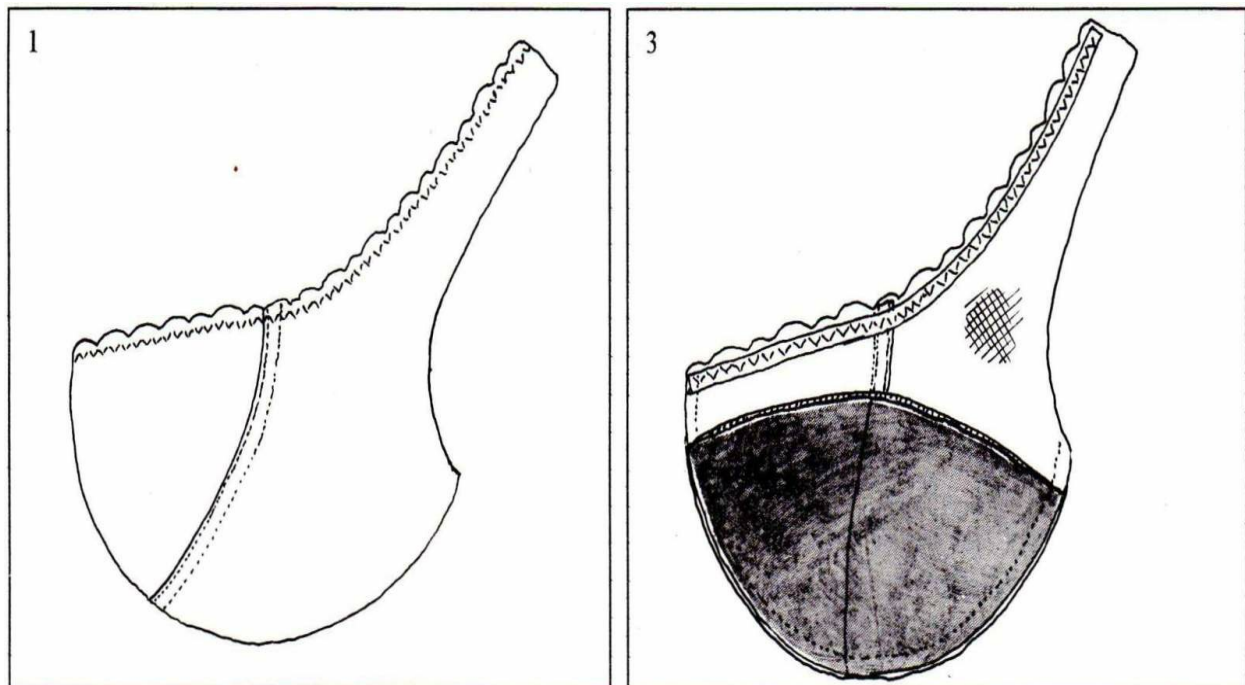
This is an extended centrepiece underwired bra with separate padded cups inside the outer stretch lace cups. The padding consists of wadding that is fused to a layer of nylon knit that sits against the skin when the bra is worn. The wadding surface of the padding sits against the underside of the lace in the bra. The overhanging lace extended centrepiece is lined with rigid

stabiliser.

- A. Side cup - self-edged stretch lace
- B. Inner cup - self-edged stretch lace
- C. Padding Side Cup
- D. Padding Inner Cup
- E. Extended Centrepiece - self-edged stretch lace lined with rigid stabilizer
- F. Back - spandex or powernet

**1. Assemble the Lace Cups and reinforce the neckline edge of the lace.**

Seam each stretch lace inner-cup to its corresponding stretch lace side cup along the vertical central cup seam using a straight stitch and matching the finished self-edges beautifully along the neckline edge. Do a back stitch at the top of this seam at the neckline edge. Trim the raw edge back that belongs to the side cup, turn both raw edges towards the side and pin stitch and top stitch them as shown. Trim raw edges back to the stay stitching. Using a zig zag stitch, sew very narrow elastic or 4mm wide plastic elastic to the back of the lace edge from the centre front of the cups to the very top point of the lace straps. This piece of elastic can be just slightly stretched a fraction as it is being sewn to the lace. Diagram 1.



## **2. *Assemble Padding Cups.***

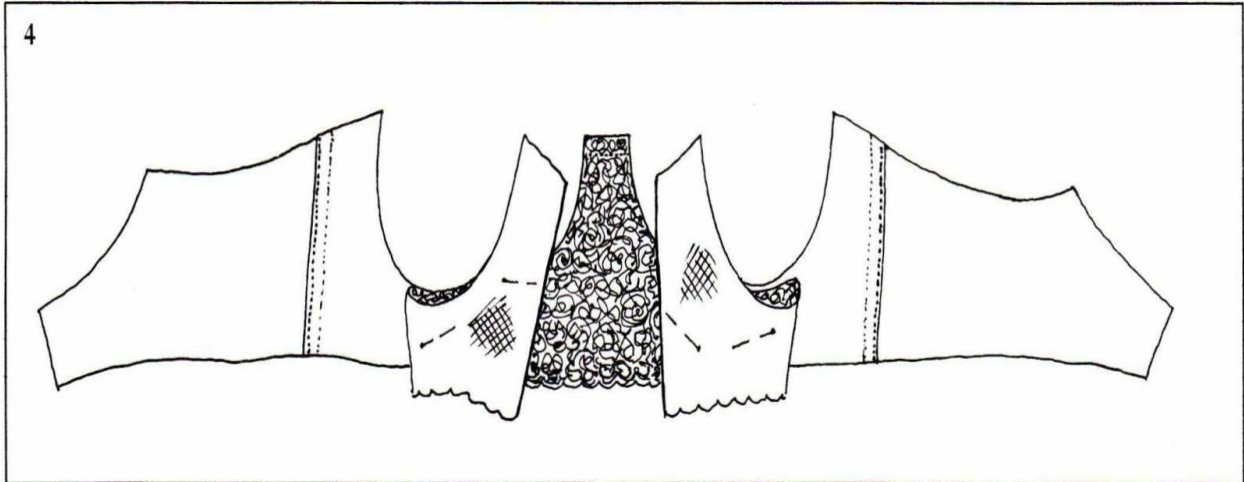
Seam each inner cup padding piece to its side cup padding piece, having the layers of nylon knit together. Trim back the wadding component of both raw edges, leaving the nylon knit layer long. Part the nylon knit raw edges and top stitch them very close to the seam line. Trim back the nylon knit raw edges. Overlock the top edge of each padding cup cutting nothing off with the blades (there is no seam allowance). If your overlocker/serger has a differential feed, slightly increase the setting to contract the top edge of the padding a fraction.

## **3. *Stay stitch each padding cup to its corresponding lace cup.***

Positioning the wadding surface of the padding cup against the underside of the lace cup and each central vertical cup seam on top of each other pin each padding cup to the inside of its lace cup. Using a long straight stitch, stay-stitch each outer lace cup to its corresponding padded cup along the wire line edge. Diagram 3.

## **4. *Line the extended centrepiece and assemble the bra body.***

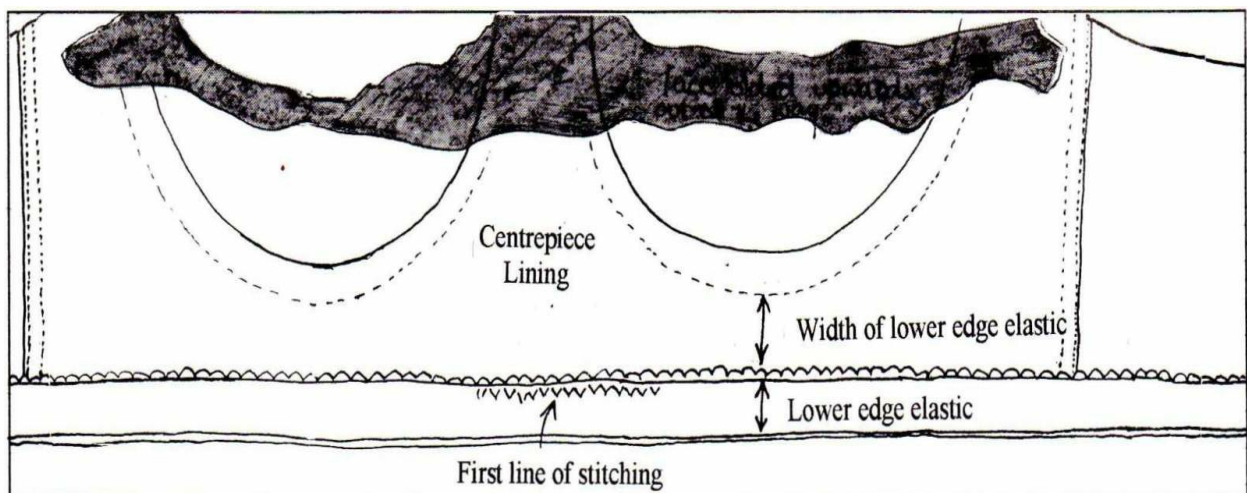
Sew the extended centrepiece (outer stretch lace) to its non-stretch lining along the top in between the cup spaces, right sides together. Trim the raw edges back and turn right-sides-out. Top stitch along the top 1cm from seam line. Seam spandex/powernet back pieces to the extended centrepiece lining along the side seams (pin the extended centrepiece lace out of the way to do this). When this seam is completed, the raw edges should be on the inside of the garment. Trim the raw edge of the lining back, fold the raw edges towards the centre front and pin stitch and top stitch as shown. Diagram 4.



### 5. **Apply the lower edge elastic - the first line of stitching.**

Fold lace centrepiece upwards (away from the lower edge) and sew the lower edge elastic, unstretched all across the lower edge using a medium zig zag positioned next to the scallops. For this first line of stitching, position the lower edge elastic so that at the bottom of each cup space on the bra body there is only just enough room to fold the lower edge elastic upwards to be top stitched before the wire line seam line is reached.

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### - **the second Line of Stitching.**

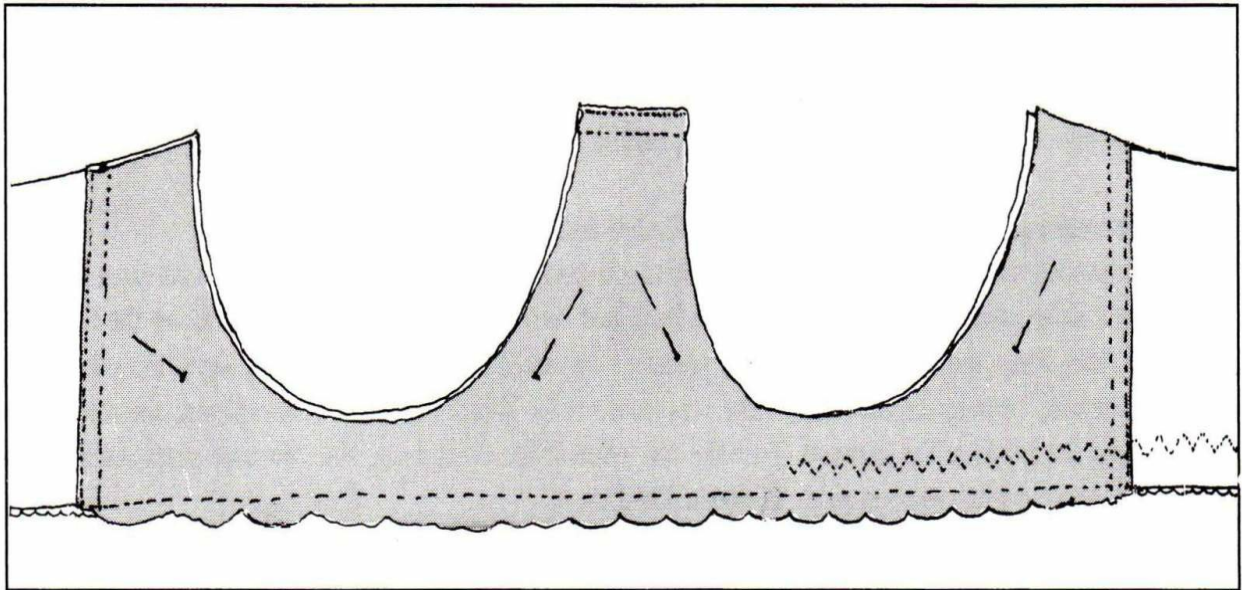
Once the lower edge elastic has been sewn around the lower edge with the first line of stitching (the medium zig zag), trim the raw fabric edge back to the zig zag (to reduce bulk) and fold the elastic upwards so that it sits at the back of the garment.



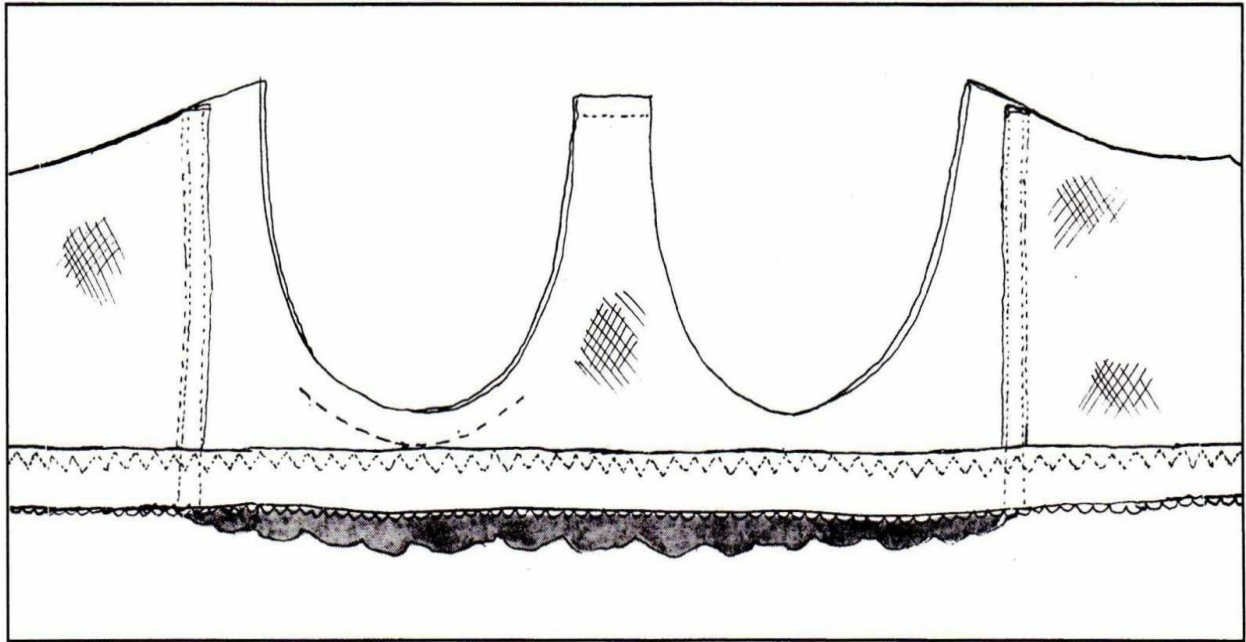
***Fold the lace centrepiece down*** so that the lower scalloped self-edge of the lace overhangs the finished elasticised edge all the way across the bra front, but at the side seam, tapers up to meet the finished lower point of the centrepiece lining and spandex/powemet back. Pin the lace in this position.

***Along the side-seams, fold the lace raw edge under*** so that the folded edge lies directly on top of the side seam. Top stitch the lace along the side seam using a line of pin-stitching and a line of top stitching.

Turn the bra body over so that its under surfaces face upwards and ***sew the second line of stitching*** (the 3 step zig zag that anchors the wider lower edge elastic upwards). This line of 3 step zig zag will also join the lace centrepiece to the centrepiece lining. To complete the bra, follow steps 7 - 19 ([pages 118-127](#)).

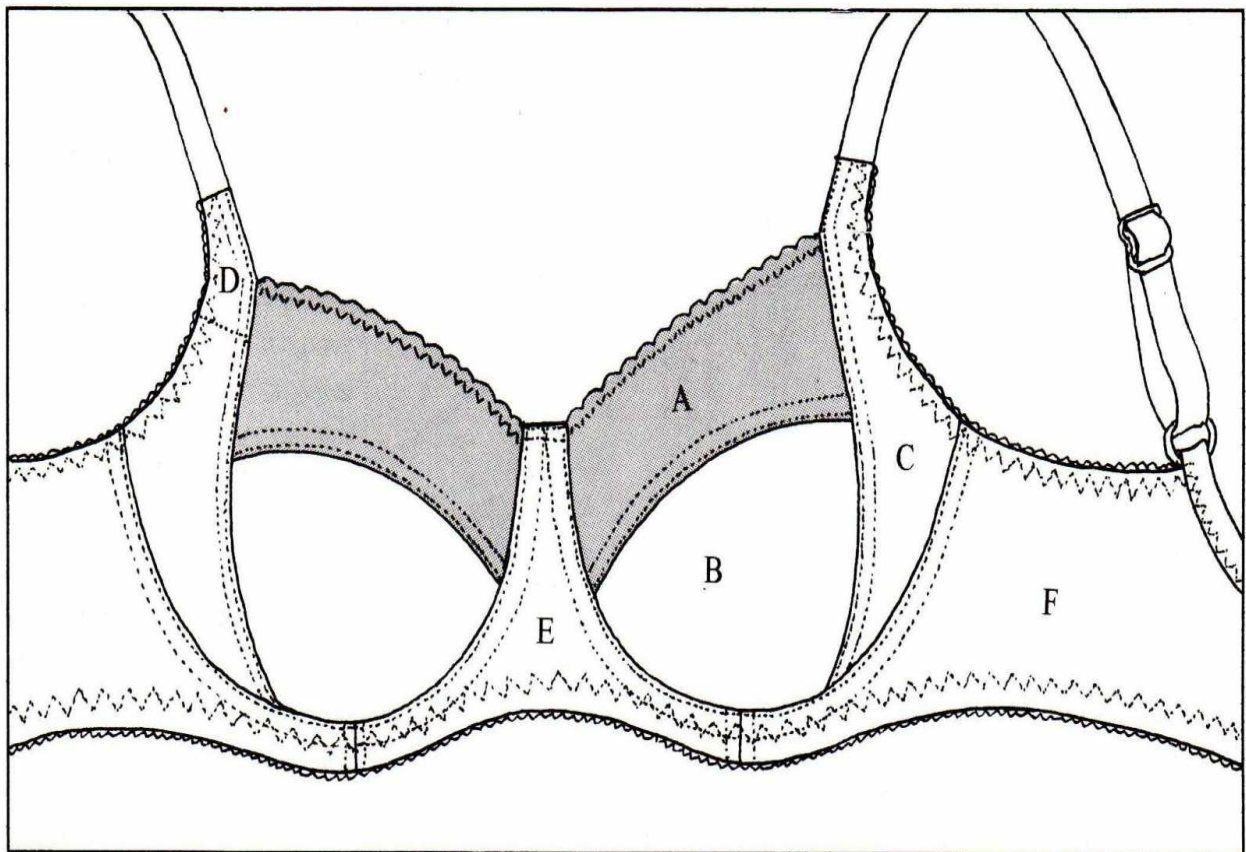






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***UNDERWIRED BRA - Example 6***



Although its sewing instructions for this bra are given here, for more detailed instructions, refer to the general sewing instructions for an underwired bra that begin on [page 114](#).

This bra has a self-edged stretch lace upper cup that is lined with sheer tricot lining. The greatest stretch in the stretch lace and the greatest give in the tricot lining both run horizontally across the upper cup. Both the lower cup and the side cup piece are made of double-knit tricot. The top section of the side cup piece acts as a part of the strap, and is fused to rigid stabiliser so that it does not become narrower when supporting the weight of the breast. Double-knit tricot contains a moderate give in one direction. The arrows in the above diagram indicate the direction of greatest give in the double-knit tricot. The Y centrepiece is made of either stretch lace or double-knit tricot that is bonded or fused to rigid stabiliser.

- A. Upper cup - stretch lace lined with sheer tricot lining
- B. Lower cup - double-knit tricot
- C. Side cup piece - double-knit tricot
- D. Side cup piece lining - rigid stabiliser fused to the underside of the top of the side cup piece.
- E. Y centrepiece - lace or tricot fused to rigid stabilizer
- F. Back - spandex or powernet

**1. *Fuse the two layers of the centrepiece together and hem the top of the centrepiece.***

Using fusible webbing, fuse the rigid stabiliser to the underside of the lace or tricot. Using an exact seam allowance, hem the top of the centrepiece in between the cup spaces. Pin stitch just under the top finished edge and iron flat with a warm iron.

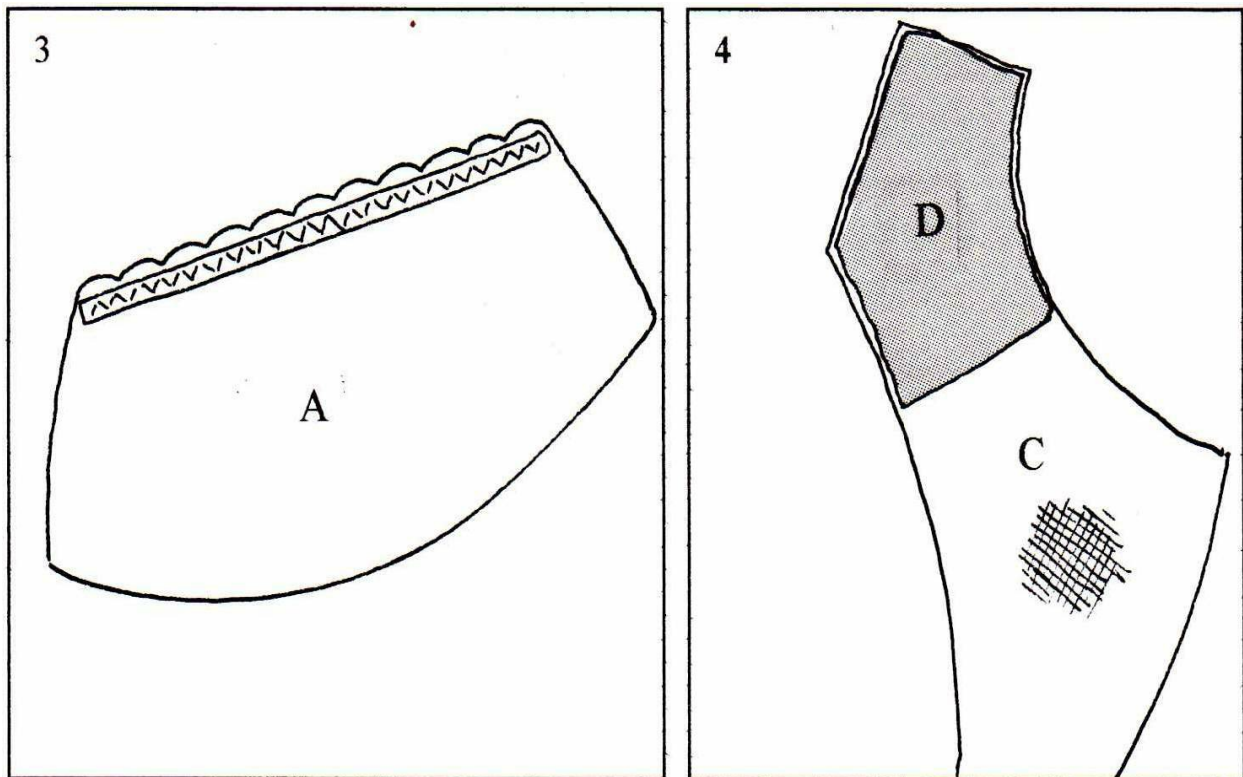
**2. *Seam the centrepiece to the bra back.***

Again, using an exact seam allowance, seam the centrepiece to the bra back pieces. Part the seam allowances and top stitch them using a straight stitch. Trim the raw edges back to the top stitching. Diagram 2. The bra body is now complete, and it can be put aside while the cups are assembled.

**3. *Assemble the upper cups and reinforce the neckline edge of the stretch lace.***

Using a walking foot on your sewing machine and a very long straight stitch positioned near to the raw edges, stay stitch each stretch lace upper cup to its sheer tricot lining layer so that they can be treated as one piece. If you don't have a walking foot for your sewing machine, hand baste the layers of each upper cup section together around the outside edge of each cup section. Zig zag a piece of unstretched narrow (4mm-6mm wide) elastic to the underside of the neckline edge at the base of the scallops in the lace. This elastic should be positioned so that its top edge will lie along the top edge of the sheer tricot lining, concealing its raw edge. After stitching the elastic in position, trim the ends of the elastic so that they are level with the fabric.

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#### **4. Reinforce the top of C.**

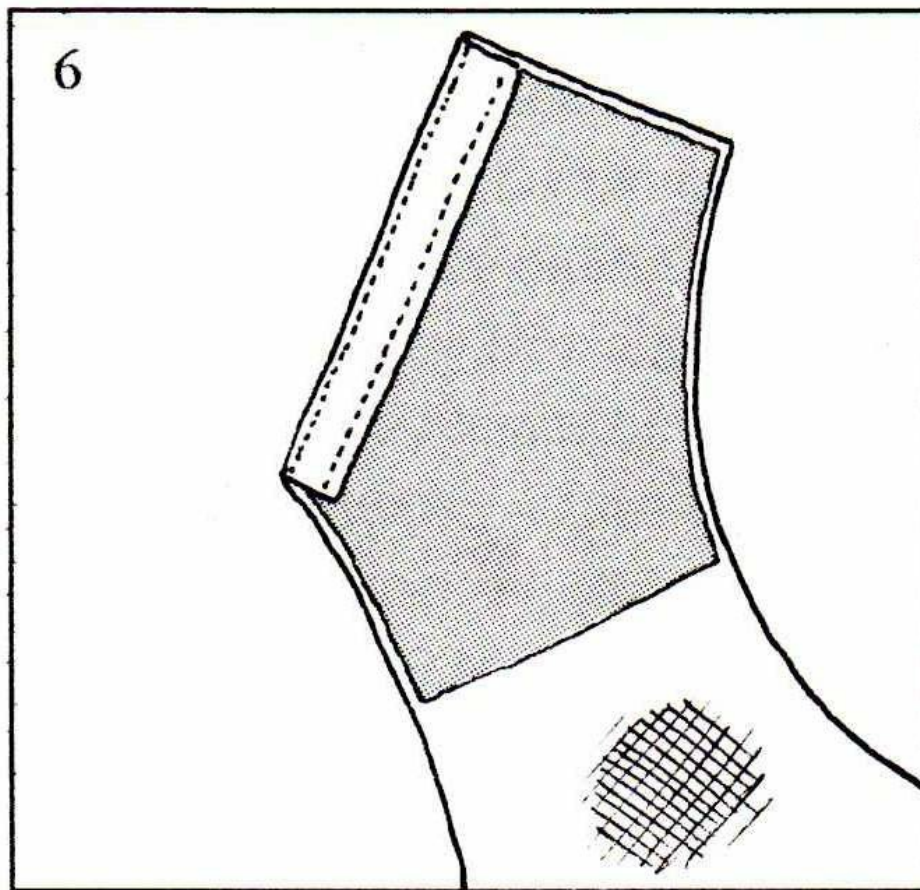
To prevent the fabric strap piece from stretching and becoming narrower just below where it is joined to the elastic strap at the front of the bra, fuse a piece of rigid stabiliser to the underside of the side cup piece (C). The most rigid (non-give) direction of the rigid stabiliser will run along the strap (parallel to the neckline edge of C).

### 5. *Seam A to B.*

Sew a line of easing stitch to the mid cup seam lines of both A and B pieces as marked on the pattern pieces. Pull the bobbin thread of the easing stitch slightly taut over the point of the cup. Using an exact seam allowance and ensuring that notches match, seam A sections to their corresponding B sections. Trim back the raw edges belonging to the upper cup (A) turn both raw edges upwards towards the upper cup and pin stitch and top stitch as shown. Neatly trim back any remaining raw edge to the line of top stitching.

### 6. *Hem C's neckline edge.*

Using an exact 1cm hem, hem the neckline edge of the side cup piece (C).

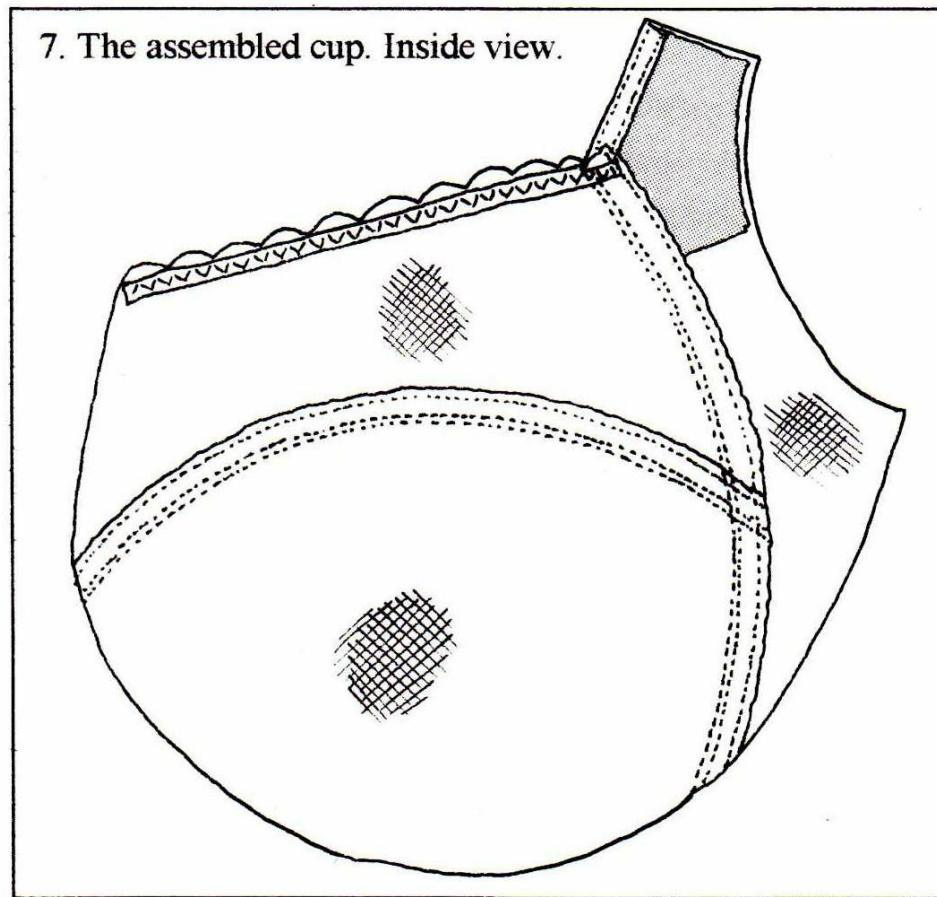


### 7. *Seam A/B to C.*

Using an exact seam allowance and correctly aligning the finished neckline edges of both the upper cup and the side cup sections, so that a neat join of the two takes place at the top of the seam, seam the inner cup sections to their side cup pieces. Trim back C's raw edge from the neckline edge



downwards, turn all raw edges towards the side and stitch as shown.



The cups are now assembled, and this bra can be completed according to the instructions on [pages 118 to 127](#) (steps 7 to 19). Keep in that this bra has back adjusting straps, so when elasticising the armhole edges, ensure that the narrow scalloped edging elastic is positioned so that the finished width of the top of each fabric strap (the top most section of C) exactly matches the width of the strap elastic to be used. When sewing rings to the bra back follow the instructions on [pages 102 and 103](#).

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## FOR THREE NON\_UNDERWIRED BRA STYLES

### CONSTRUCTION OF A NON-UNDERWIRED BRA

If you have a **commercial pattern for a non-underwired bra**, then you can simply follow the prescribed sewing instructions. **Some non-underwired**



***bras are almost identical to an underwired bra***, only they haven't the underwire. If this is the case, the same underwired bra's sewing instructions can be followed with the omission of the insertion of the underwire. If however you have ***drafted your own pattern from a non-underwired bra*** then your sewing instructions will be determined by the style of your bra. There are many different styles of non-underwired bras, and each different style has its own set of sewing instructions. You will have to analyse your particular bra style to determine which seams are sewn first. Observe the style diagram (refer to [page 39](#)) of your particular bra style and ask yourself, 'What would I sew first?' 'Which bits would I sew together then?' (Refer to [page 43](#)). See if you can discover the order of sewing yourself. Write down an order of sewing as you go through this mental exercise and picture in your mind the bra coming together piece by piece. In underwired bras, the shape of the underwire standardises its general design, making it possible to arrive at a set of general sewing instructions for an underwired bra. Because of the vast array of non-underwired styles, it is impossible to generalise their sewing instructions, however the following basic principles may be of use when formulating an order of sewing for your particular non-underwired bra.

- As a general rule when sewing a non-underwired bra, the shorter seams have to be sewn first.
- If the bra style can be broken up into large sections that are joined by fairly straight seam lines, each large section can be sewn individually, and then the large sections can be assembled to produce the total garment.
- If your bra has a V neckline, to produce a crisp V at the centre front, each cup's neckline edge will have to be completed with narrow edging elastic before the centre front seam should be sewn.
- In most non-underwired bras there is a fairly straight side seam joining the bra front to the bra back. Where this is the case, the cups and centrepiece have to be sewn together first and then this whole front section of the bra is seamed to the bra back.
- Where there is a stretch fabric section in between the cups at the centre front, this area is often reinforced with a lining piece of rigid stabiliser that is either fused or sewn to the underside of the stretch

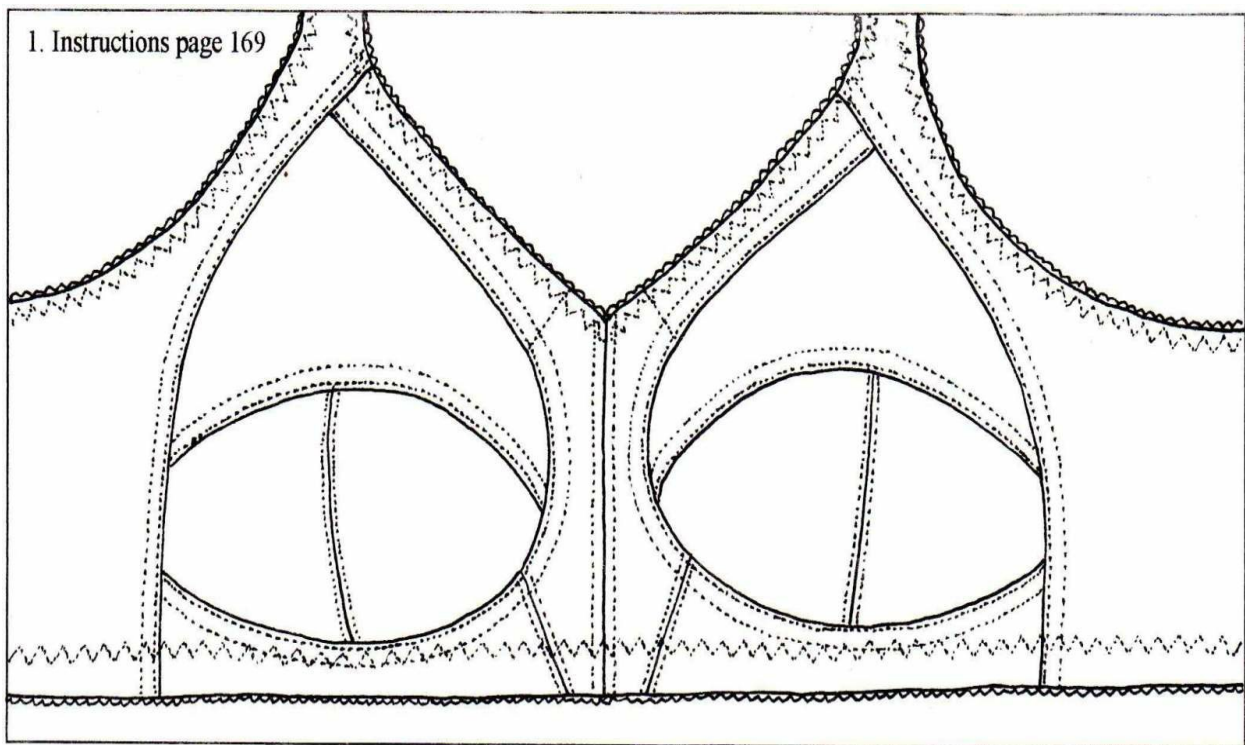
fabric. Using a piece of rigid stabiliser in this way prevents the cups from stretching apart when the bra is worn. Reinforcing the centre front sections in this way has to be done at the outset before the rest of the bra is sewn together.

- Once the bra is assembled, all raw edges on the inside can be concealed in the finished garment by edge stitching felt-type underwire casing, bias binding, or pre-shrunk cotton tape over them. Covering the raw edges in this way not only neatens the inside of the garment, but gives the bra more garment body.

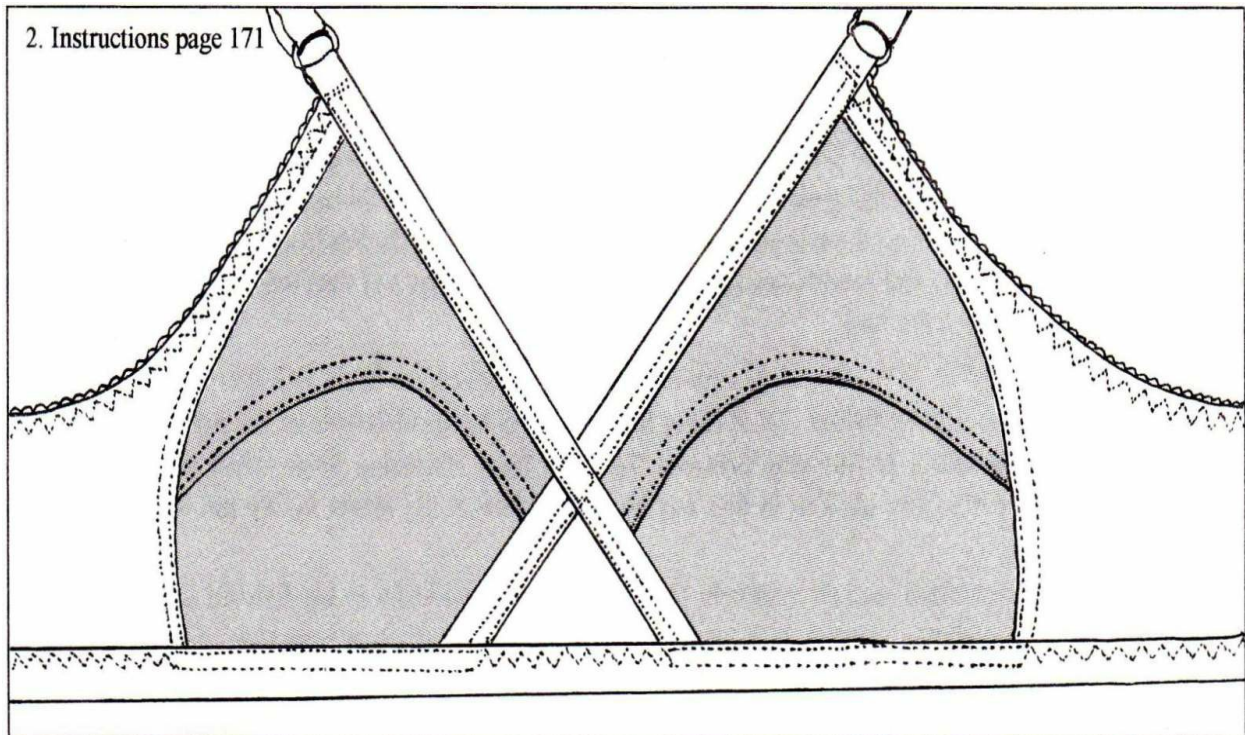
The following are three different styles of non-underwired bras. Refer to the appropriate page for each style's sewing instructions.

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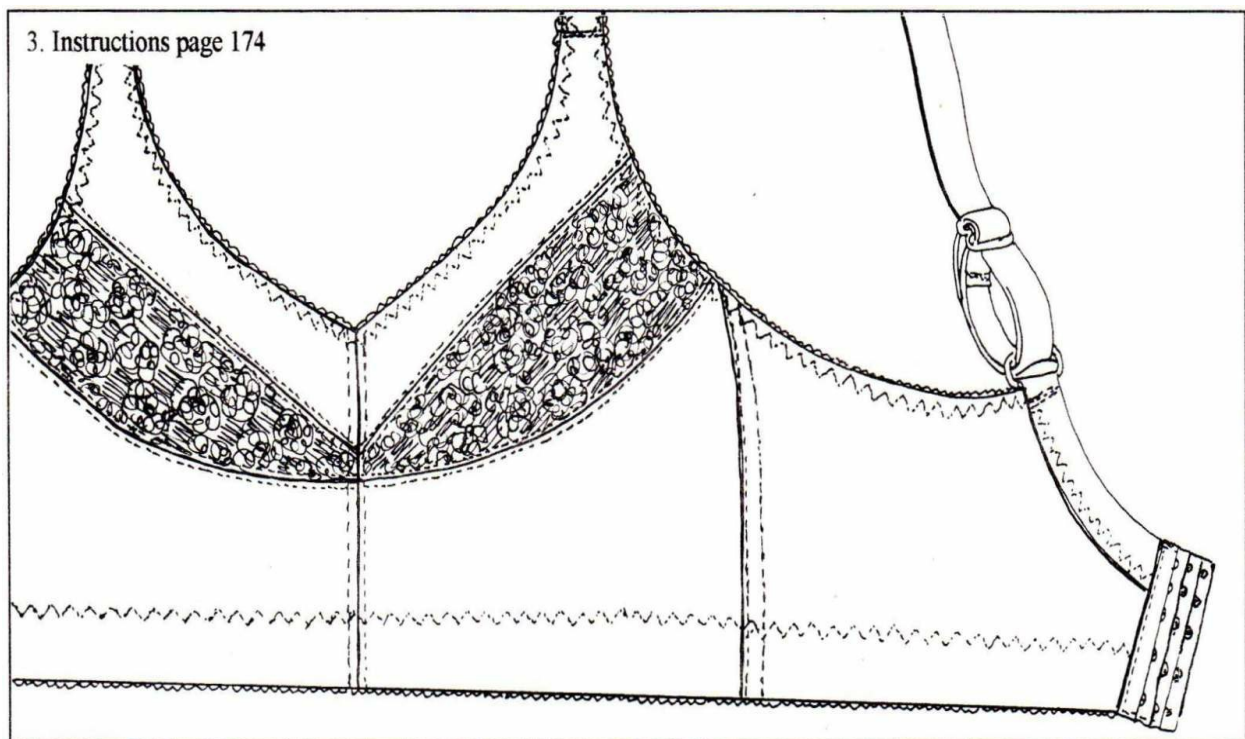
Instructions [page 169](#).



Instructions [page 171](#).

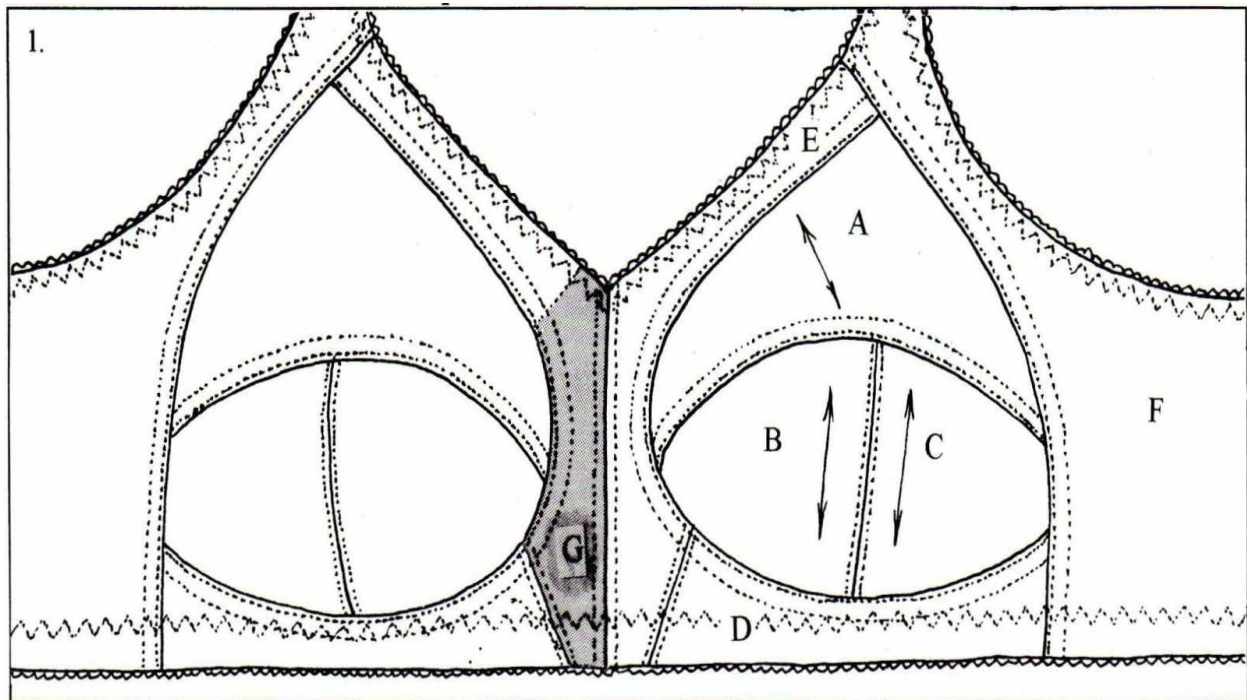


Instructions [page 174](#).





## NON-UNDERWIRED BRA - Example 1



This bra has bonded lace cups (a fine non-stretch lace that is bonded to a cotton knit) It contains a slight one-way give that is indicated on the style diagram above by arrows.

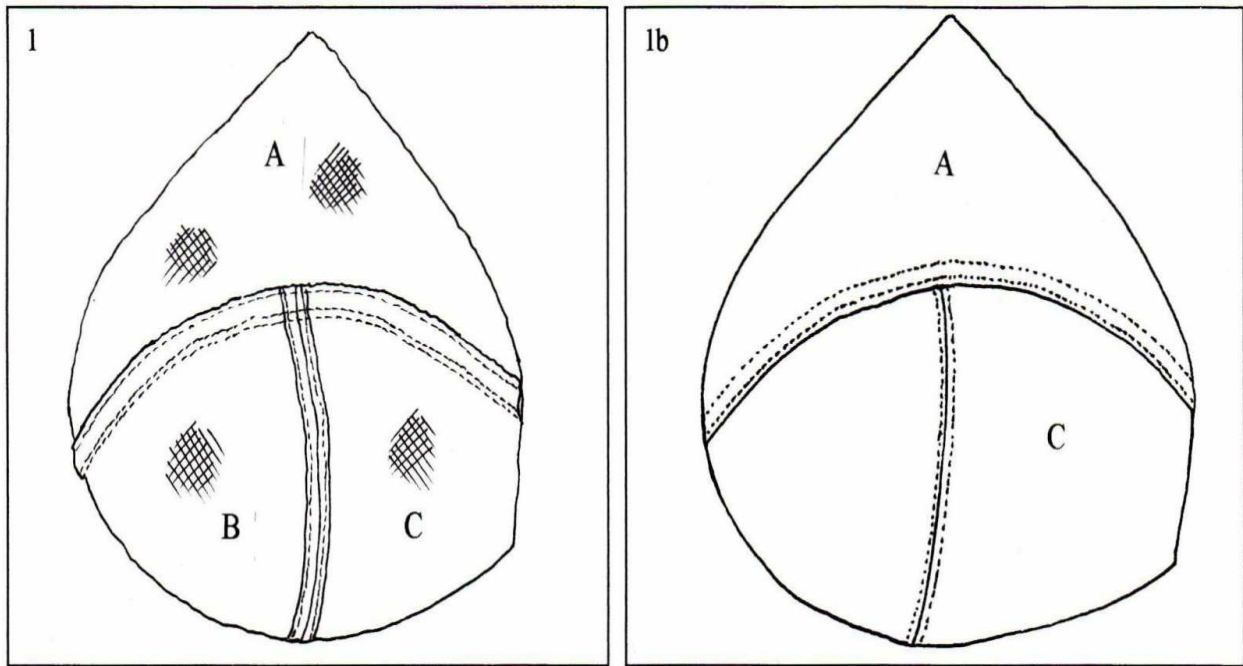
- A. Upper cup - bonded lace
- B. Inner Lower Cup - bonded lace
- C. Outer Lower Cup - bonded lace
- D. Under Cup Piece - bonded lace
- E. Neckline edge Piece - spandex or powernet
- F. Bra back - spandex or powernet
- G. Centre front Support Piece - rigid stabiliser lining fabric

Note: G is simply stay-stitched into the correct position behind the corresponding lower section of the E pieces, and then both E and G are treated as one piece.

### 1. **Assemble the Cups.**

**Seam B to C.** Sew the lower-cup's central seam using a small straight stitch. Part the raw edges and top stitch as shown, positioning the stitching  $\frac{1}{2}$  cm away from the seam line. Trim the raw edges back.

**Seam A to B/C.** Seam each lower cup to their matching upper cups. Trim the raw edges belonging to the upper cup back, turn all raw edges upwards and top stitch using two lines of straight stitching - one line of 'pin-stitching' (a pin width away from the seam) and another line of top stitching that is ½ cm away from the seam as shown below. Trim any remaining raw edge back to the line of stitching. Diagram 1b.



[page 170]

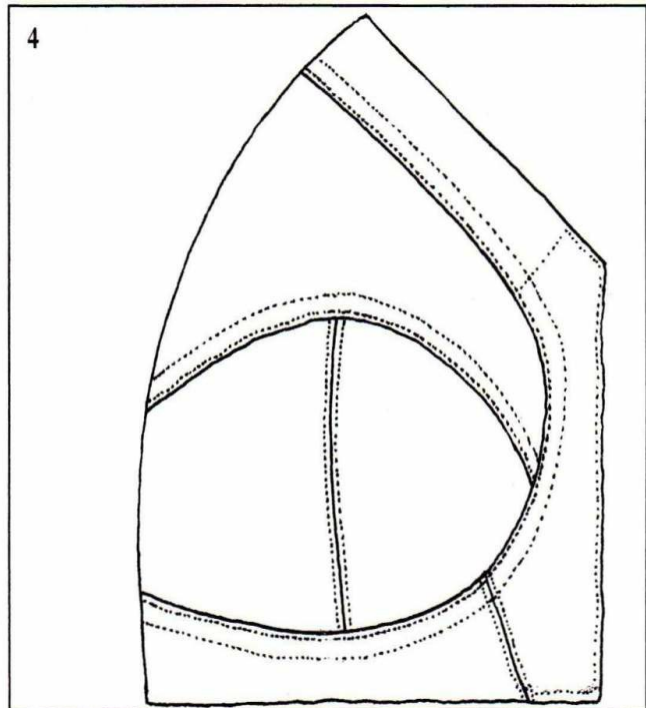
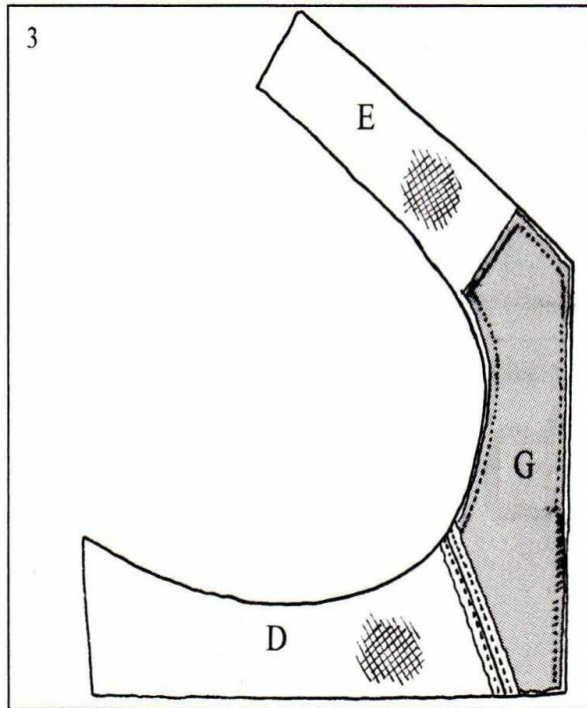
## 2. **Stabilise the centre front section of E.**

Stay stitch G to the inside surface of the neckline edge piece (E). Position your stitching very close to the outside edges of the two pieces.

## 3. **Seam the neckline edge piece to the under-cup piece** (join D to E).

When pinning this seam, ensure that the raw edges of the fabric at the top and bottom of the seam meet exactly on the seam line. Doing this will produce a continuous raw edge when the two sections are pulled apart from each other. Part the raw edges and top stitch ½ cm away from the seam line. Trim the raw edges back to the lines of top stitching.



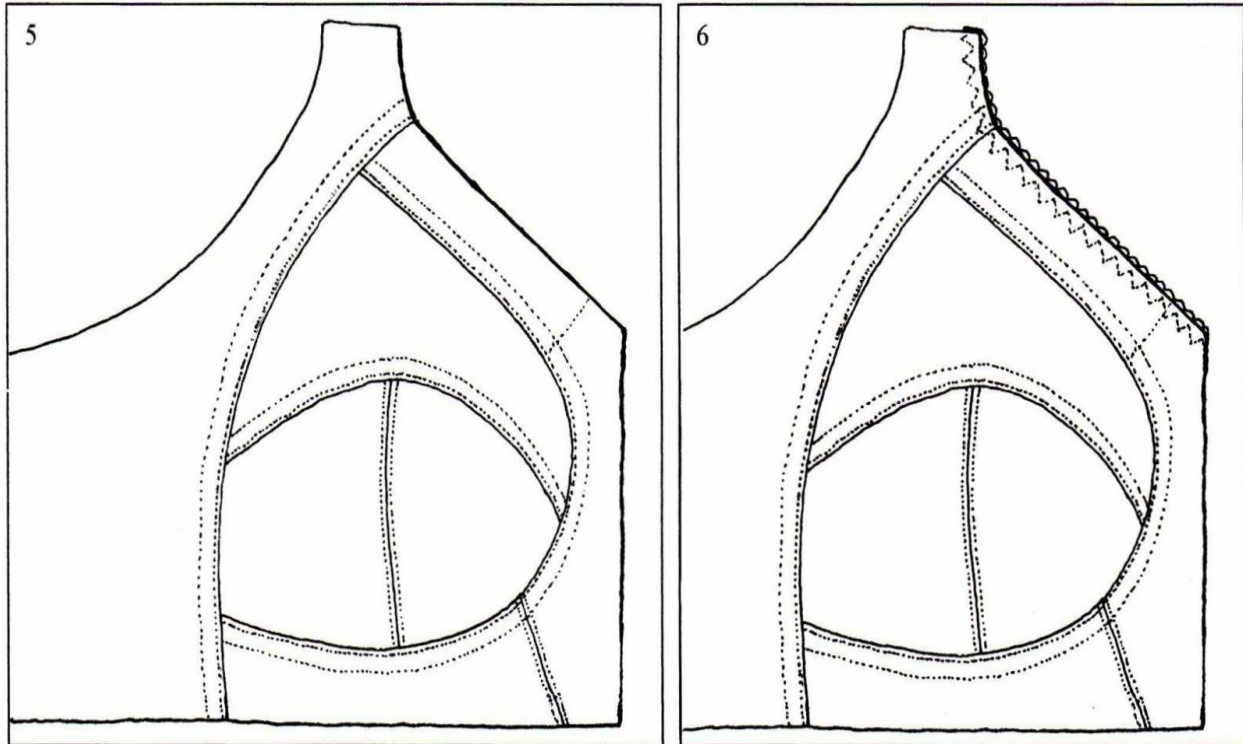


**4. Seam each cup to D/E sections.**

It may be necessary to slightly stretch the D/E sections in order to fit the cup onto it. Once this seam is sewn, trim back the E/D raw edge and fold all the raw edges hard out of the cup. Pin stitch and top stitch as shown. If desired, narrow edging elastic can be edge stitched over this stitching.

**5. Seam each cup to the bra back.**

Seam A/B/C/D/E to F. When this seam is sewn, trim back the raw edge that belongs to the bra back, fold all the raw edges towards the back (away from the cup) and pin stitch and top stitch as shown. If desired, narrow edging elastic can be edge stitched over this stitching.



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**6. Finish off the neckline of each cup with narrow scalloped elastic.**

Refer to [page 97](#). Ensure that you leave an elastic overhang at the centre front edge of each cup. In this way, there will be an adequate length of elastic to trim it off flush with the raw centre front fabric edge.

**7. Seam each half of the bra together along the centre front seam.**

Take care to make the finished neckline edges meet exactly at the centre front and use a back stitch at the top of the seam (at the point of the V). If desired, this seam may be double stitched in order to give it additional strength. Part the raw edges and top stitch apart, positioning your stitches near to the raw edges.

**8. Finish off the entire lower edge with unstretched wide scalloped elastic:** refer to [page 97](#).

**9. Finish off each total armhole edge with narrow scalloped elastic.**

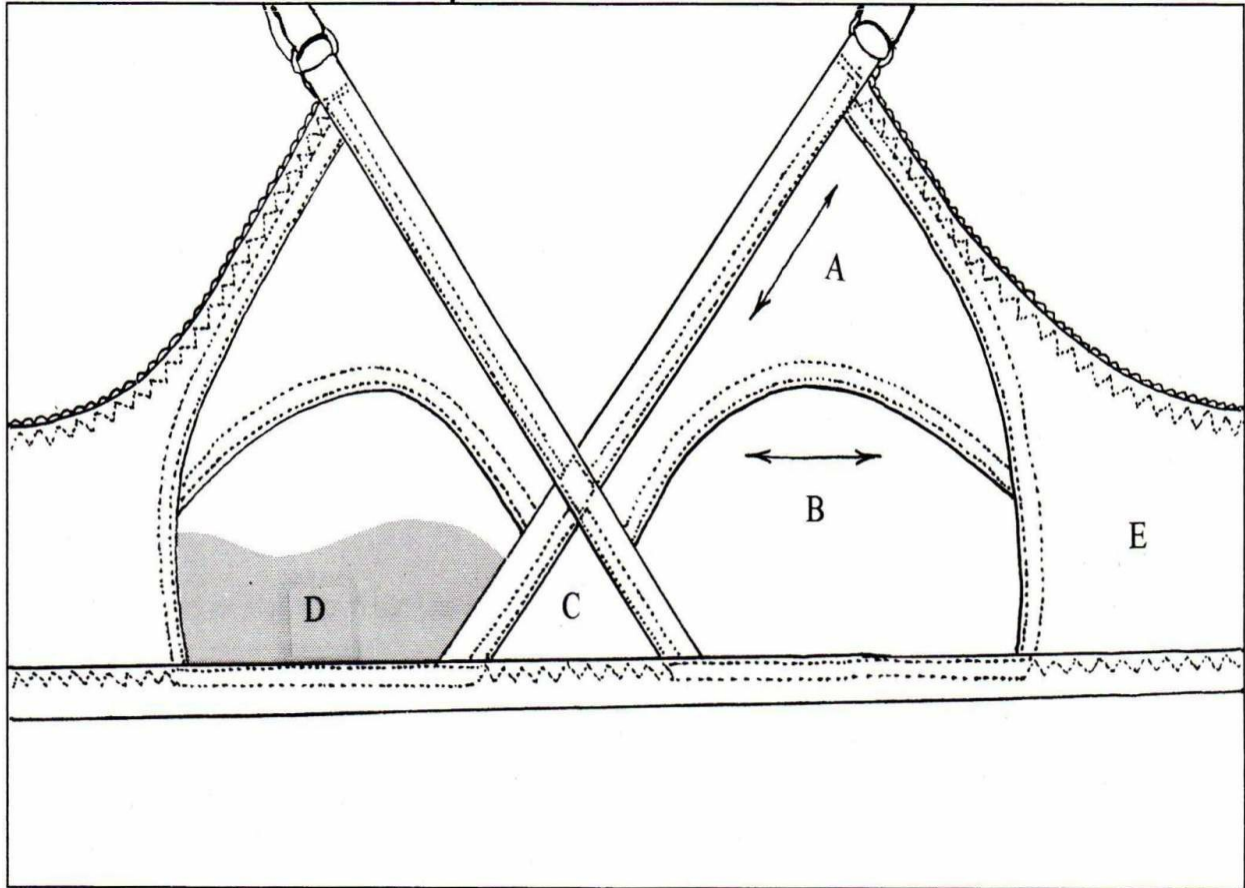
**10. Sew a ring securely to the top point of each cup.**

**11. Assemble the straps and slides:** refer to the instructions on [page 105](#).

12. **Sew each strap to the bra back** after checking the height of the closure tab, referring to the instructions on [pages 106](#) and [107](#).

13. **Apply the hook and eye tabs:** refer to the instructions on [pages 108-111](#).

### **NON-UNDERWIRED BRA - Example 2**

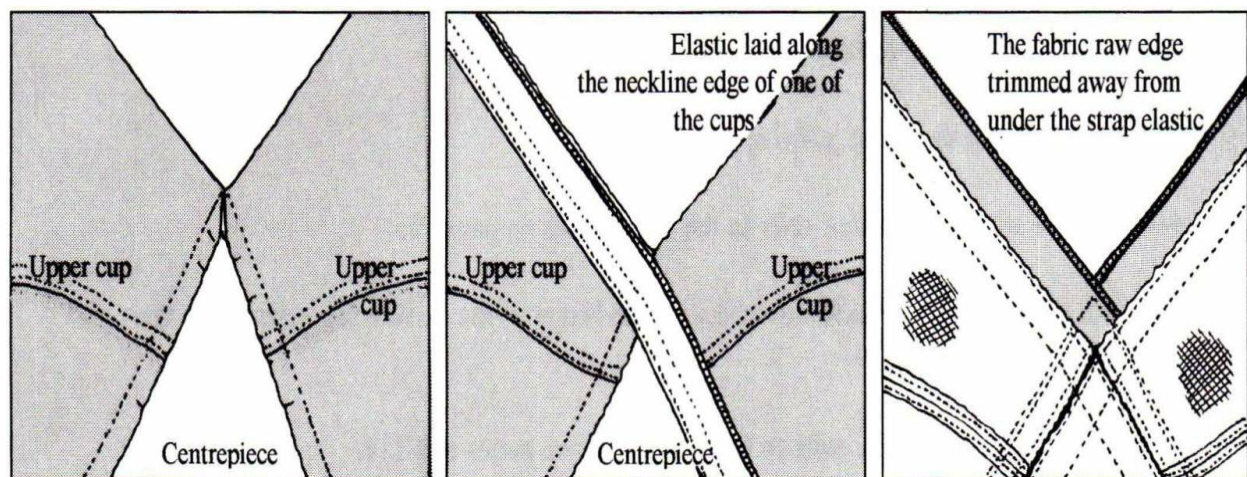


This bra has rigid bonded lace cups (a fine non-stretch lace that is bonded to rigid stabiliser). It contains a slight one way give that is indicated on the style diagram above by arrows.

- A. Upper cup - bonded lace
- B. Lower Cup - bonded lace
- C. Centrepiece - powernet
- D. Lower cup support piece - compressed covered foam
- E. Bra Back - spandex or powernet

Note: When constructing this type of bra, both the neckline edge and the entire lower edge are finished by sewing unstretched strap elastic to the edge in the following manner:

- The strapping is simply laid flat onto the garment, ***with the underside surface of the strap elastic against the right-side surface of the fabric:***
- ***The outer/outside edge of the strap elastic is positioned directly over the raw edge of the fabric.***
- The strapping is then sewn to the bra, ***using a type of stitch that is determined according to whether or not the edge has to stretch.*** If the edge has to stretch, use a zig zag or three-step zig zag stitch.
- ***This line of stitching is positioned along the inside edge of the strapping.***
- Finally, ***the raw fabric edge under the outside half of the strapping is trimmed back to the line of stitching.*** If the edge is not required to stretch, bias binding or cotton tape can be edge stitched over the raw fabric edge on the inside of the garment. This will ensure garment comfort when the bra is worn.



When drafting a pattern from one of these cross-over types of bras, be aware that ***there is no seam allowance around the neckline edge or the lower edge of the bra*** as both of these edges are finished off with strap elastic in this way. Therefore, ***the finished neckline edge of the upper cup*** (which is the top neckline edge of the strap elastic), ***will also be the cutting edge of the upper cup fabric.*** In this way, differing widths of strap elastic can

be used to that in the original manufactured bra without the size and fit of the bra being inadvertently altered.

**1. *Apply an easing stitch to the cup sections as required.***

Easing stitching, when used at the point of the cup, can help make the tip of the cup more rounded.

**2. *Seam upper cup pieces to lower cup pieces.***

Ensure that any notches on the cup pieces are correctly aligned. Trim back the raw edge belonging to the upper cup, turn all raw edges upwards and pin stitch and top stitch them as shown. Trim any remaining raw edge back to the top stitching.

**3. *Overlock the top edge of the lower cup support piece.***

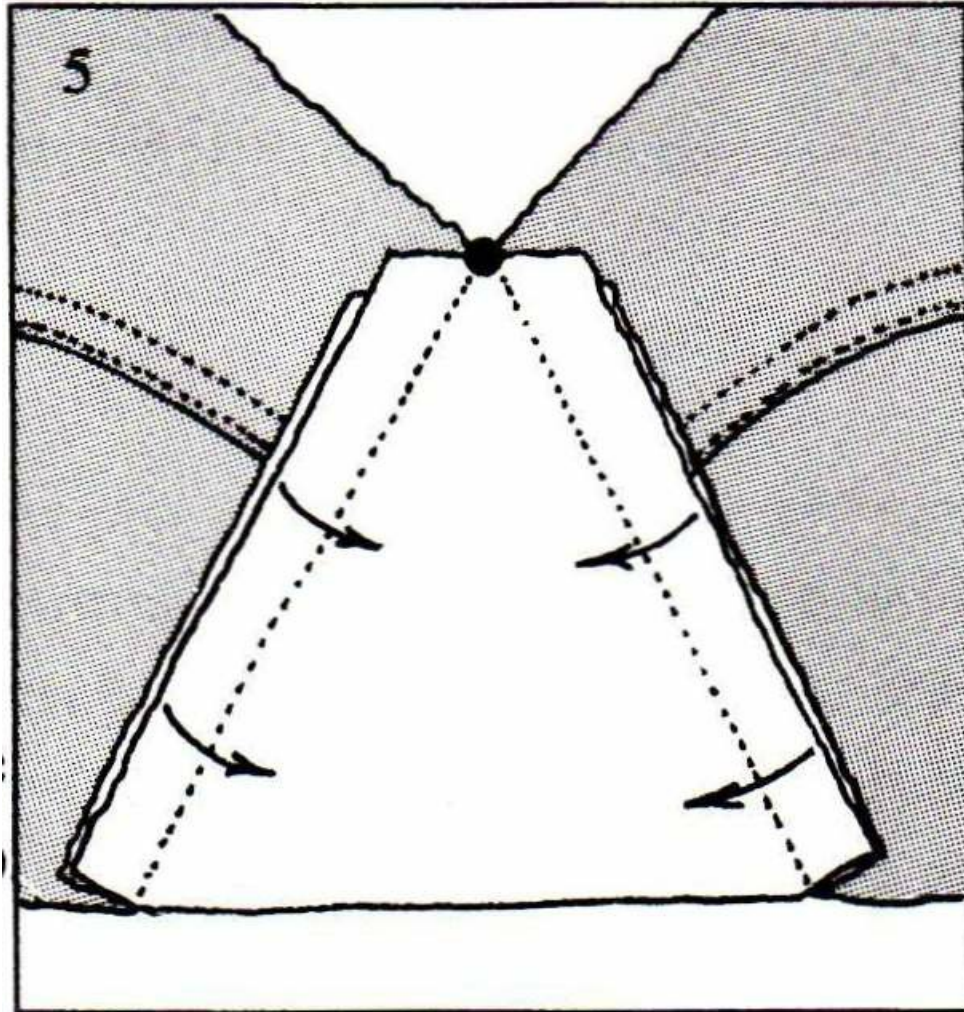
When finishing this top edge, position the edge so that that the knives on your overlocker/serger do not cut off any of the padding.

**4. *Stay stitch each lower cup support piece in its finished position against the back surface of each cup.*** The two can then be treated as one piece.

**5. *Seam the sides of the centrepiece to the centre front edges of each cup.***

Before sewing these two seams, in order to produce a neat three-way join at the top of the centre piece, trim any seam allowance off the top point of the triangular centre piece, so that its top finished point is right on its raw edge (this is indicated by a dot in diagram 5). This point should be pinned to the top raw neckline edge of the upper cup fabric, (at the top of the seam).





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**Note:** When pinning these seams, ensure that the **wrong** sides of the fabric are together, so that when the seam is sewn, all the raw edges will be on the **right side** of the bra. After sewing these two seams, grade the raw edges, trimming the raw edges of the triangular centrepiece back the most. After grading the raw edges, turn all the raw edges towards the centre front of the bra. Diagram 5.

6. **Sew the side seams joining each cup to bra back sections** (right sides together). Trim back the raw edges belonging to the bra back and turn all raw edges toward the centre back of the garment. Ensuring that the raw edges are flat against the inside of the garment, edge stitch a piece of narrow decorative lace onto the outside of the bra so that the lace lies directly over this seam's raw edges. If desired, at the conclusion of the

sewing process, bias binding can be edge stitched over these raw edges on the inside of the bra.

**7. *Elasticise the armhole edges*** with unstretched narrow scalloped elastic. Refer to [page 97](#). The edge to be finished with narrow scalloped elastic will extend from the top of the cup to the point where the strap joins to the bra back.

**8. *Sew the crossed over straps to the bra front, leaving a 4cm long strapping overhang at the top of each cup*** (this will be later threaded through each ring and sewn securely to the underside of the upper cup). Note: The width of the crossed over strapping on the front of one of these bras is generally slightly narrower than the width of the bra straps. Lay a length of strapping along the neckline edge of the upper cup and down along the seam that joins the cup to the centrepiece. The top edge of the strapping should be positioned directly over: the raw fabric neckline edge of the cup, and the seam that joins the centrepiece to the cup. Using two lines of straight stitching, (one that is positioned on the lower edge of the strap elastic, and the other positioned along the middle of the strap elastic), sew this strap to the bra front, leaving the necessary overhang. Trim away the neckline edge fabric of the upper cup that lies under the top half of the strapping. In a similar manner, sew another length of strapping along the raw neckline edge of the other cup.

**9. *Sew the rings securely to the upper cup***

**10. *Sew unstretched strap elastic around the lower edge.***

Position a piece of strap elastic around the lower edge of the bra flat-on-flat as outlined on [page 172](#), so that the right side of the bra is against the back surface/wrong side of the elastic, and the lower edge of the elastic is flush with the raw edge. Using a very wide, fairly closely spaced three-step zig zag that is positioned just a fraction below the top edge of the strapping, sew the elastic all around the lower edge. Trim the fabric that lies under the lower half of the strap back to the line of stitching. In order to flatten the thick raw edges directly beneath the cups, it is advisable to sew a line of straight stitching right on those raw edges. These raw edges beneath each cup can then be covered with a piece of edge stitched bias binding. Using

straight stitching below each cup will not impede the fit of the garment, as both the cup fabric and the padded lower cup support piece are virtually non-stretch. It is only across the base of the centrepiece and across the lower edge of the bra back that a zig zag stitch is required.

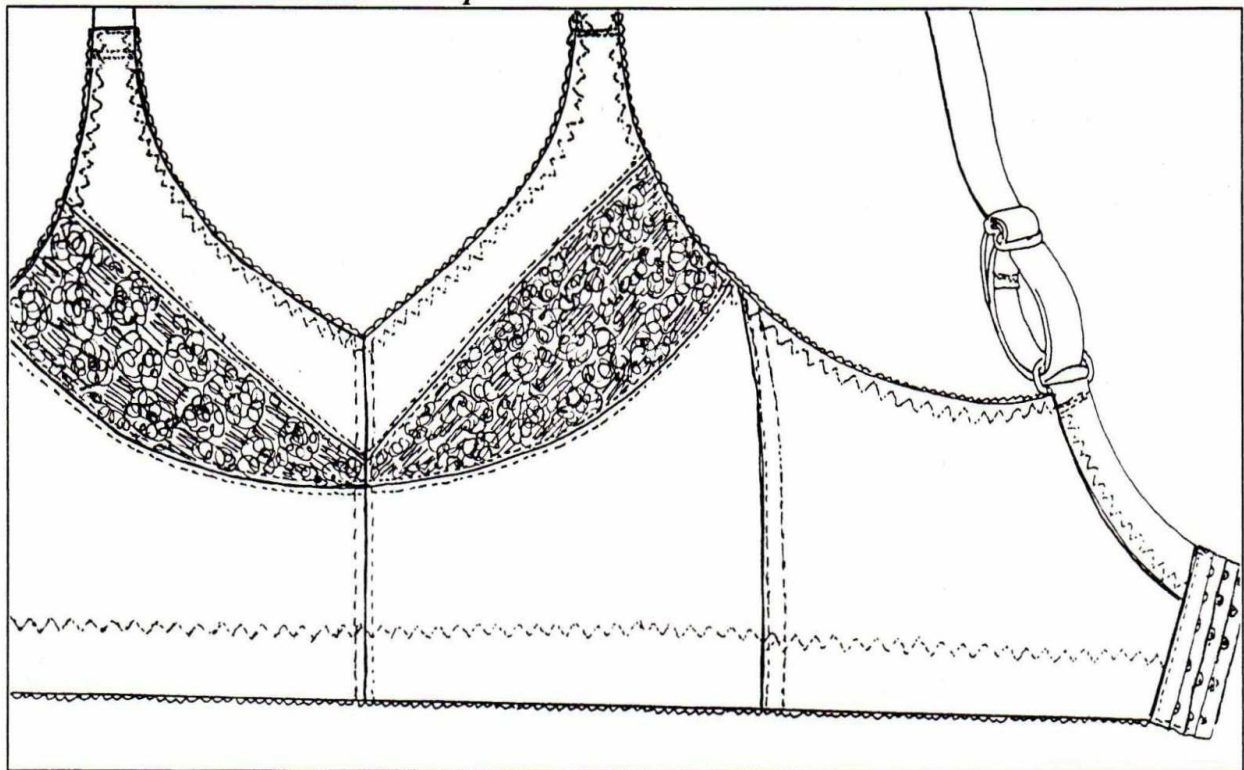
11. **Assemble the straps and slides**, referring to the instructions on [page 105](#).

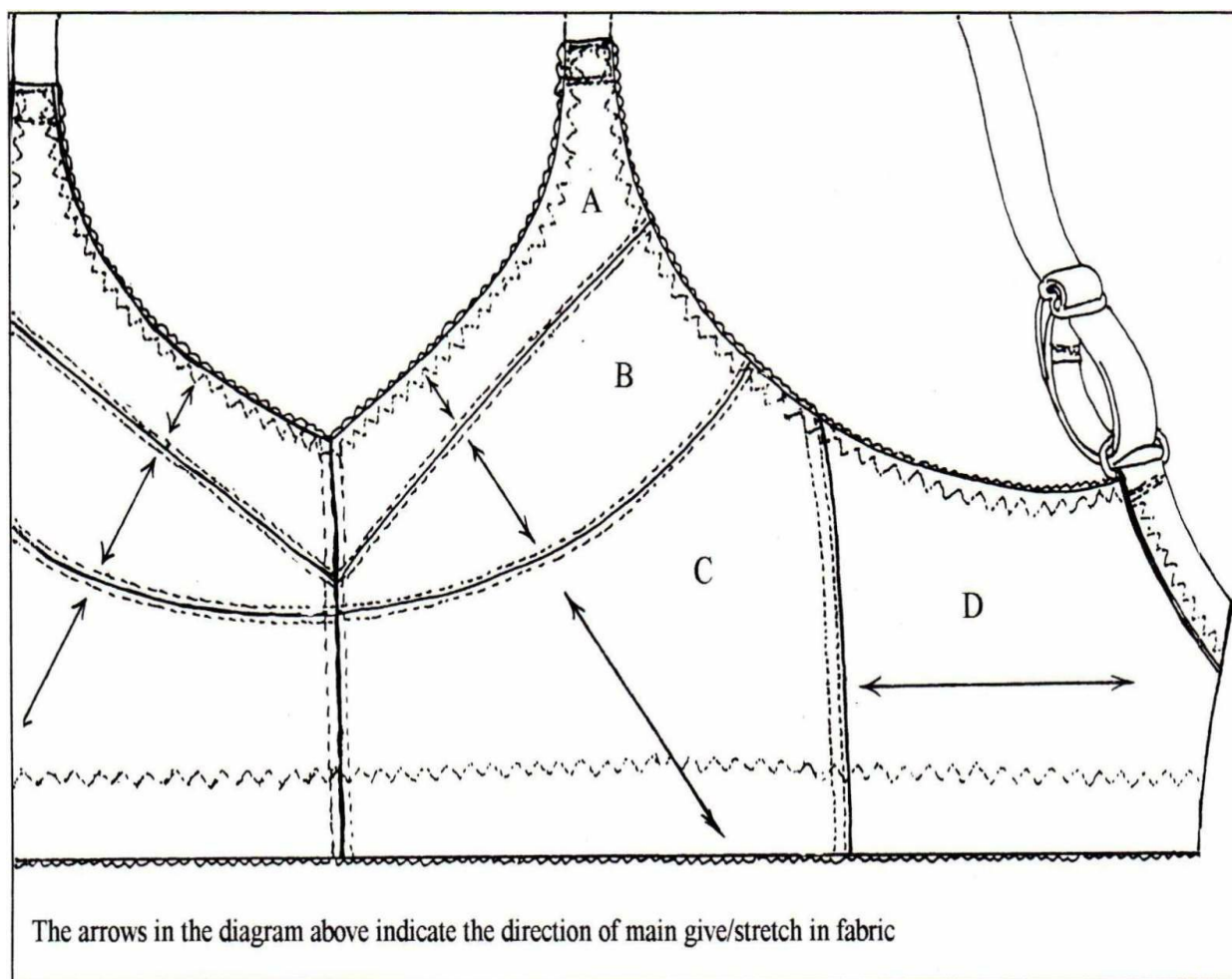
12. **Sew each strap to the bra back** after checking the height of the closure tab, referring to the instructions on [pages 106](#) and [107](#).

13. **Apply the hook and eye tabs**: refer to the instructions on [pages 108-111](#).

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### **NON-UNDERWIRED BRA - Example 3**





- A. Neckline Edge Piece - double-knit tricot
- B. Middle Cup Piece - non-stretch lace (slight one-way give) lined with single-knit tricot
- C. Lower Cup - double-knit tricot lined with single-knit tricot
- D. Bra Back - spandex or powernet.

1. For the lined cup sections (the middle and lower cup pieces) the outer fabric and lining of each section are treated as one when this bra is being constructed. ***Stay stitch the outer layer of each middle cup piece and lower cup to its lining.*** The wrong sides of each fabric layer should be together. When stay stitching these layers together, use a long straight stitch positioned 1cm in from the raw edges. A 'walking foot' on your machine will be very helpful in minimising slippage between the layers.



**2. *Apply an easing stitch to the cup sections as required.***

Easing stitching, when used at the point of the cup, can help make the tip of the cup more rounded.

**3. *Seam each neckline edge piece to its respective middle cup piece.*** Ensure that any notches on the cup pieces are correctly aligned Part the raw edges and top stitch as shown. Trim back the raw edges to the lines of top stitching.

**4. *Seam each lower cup to its respective upper cup.*** Part the raw edges, top stitch and then trim back the raw edges to the lines of top stitching.

**5. *Seam each bra back to its respective cup*** along the side seams. Grade the raw edges, trimming away the raw edge belonging to the bra back the most. Turn all the raw edges towards the centre back and pin stitch and top stitch as shown.

**6. *Finish off each cup's neckline edge using unstretched, narrow scalloped elastic.*** Ensure that you leave an elastic overhang at the centre front so that once the second line of stitching is completed the elastic can be trimmed flush with the raw fabric edge. Refer to [page 97](#).

**7. *Sew the centre front seam*** using a small straight stitch, taking care to make the finished neck line edges of each cup, as well as the cup seams meet beautifully at the bra centre. It is a good idea to re-stitch this seam (double stitch) as it needs to be very strong. Part the raw edges and top stitch as shown.

**8. *Finish off the entire lower edge of the bra using unstretched, wide scalloped elastic:*** refer to [page 97](#). Note that bras of this design often have unusually wide scalloped elastic around their lower edges. The width of the elastic to be used should be exactly the same as the width of the lower edge seam allowance.

**9. *Finish off each armhole edge using narrow scalloped elastic.*** Before you begin sewing the elastic, take care to position it at the top-most point of each cup so that the finished width of the fabric will exactly match the width of the strap elastic to be used.



**10. Sew a ring to the bra back using a short length of strap elastic and assemble the straps and slides. Sew the end of the strap neatly and securely to the top of the cup.**

Refer to the general instructions on [pages 102-103](#) and [106-107](#). As this bra is back adjusting, the ring will be sewn onto the bra back, and the end of the adjustable strap will be sewn to the top-most point of the cup. The piece of strapping that will secure the ring to the bra back should be positioned according to the exact height of the closure tab (so that the top edge of the strapping continues onto the top edge of the closure tab).

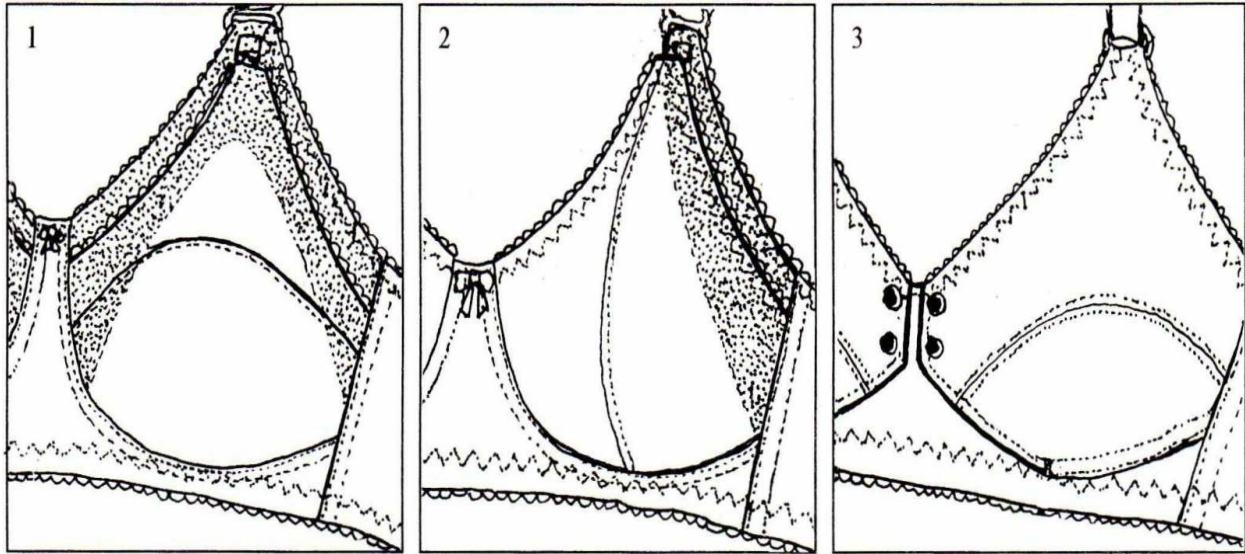
**11. Apply the hook and eye tabs:** refer to the instructions on [pages 108-111](#).

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## DIFFERENT TYPES OF BRAS

### Nursing Bras

A nursing bra commonly has an outer cup over a partial inner cup. It is the partial inner cup that holds the bra straps in place once the outer cup has been disengaged to allow breast-feeding to take place. In the following diagrams the shaded area indicates the shape of the underlying inner partial cup. The inner partial cup is generally made out of a stretch fabric, and can have a pointed, triangular-type of shape (diagram 1), or be a straight piece under the side cup (diagram 2). A more recent design is to have no inner cup, with the outer cup disengaging and peeling back from the centre front (diagram 3).



Regardless of its style, it is absolutely essential that a nursing bra performs its function well. The following characteristics are integral to a well-designed, beautifully fitting nursing bra.

- ***A nursing bra should offer the breasts adequate cup volume.*** The lactating breast will fluctuate in its volume, especially in the early stages of breast-feeding. In order to prevent blocked milk ducts and mastitis, it is important to have nursing bra cups that are a fraction on the roomy side rather than being too tight and constricting. Allowing the nipple to project naturally into the tip of the cup is also very important, because cups that are too small or too shallow in shape will tend to 'flatten' the nipple: a very uncomfortable/painful outcome.

I also recommend having a degree of horizontal give in the upper cup fabric, running parallel to the neckline edge of the cup. This upper cup fabric give will provide the breasts with 'room to move'. Even though the cups should give the breasts a little bit of room to move, this need not compromise the uplift/support that a nursing bra gives. The cups should only have a little bit of extra volume ... not a lot.
- ***A nursing bra should not be overly tight around the margin of the breast.*** A tightly-pulling margin can produce pressure points on the breast and impede milk flow even when the outer cup is disengaged. Because breast tissue normally extends right around into the

underarm area, it is important that the side seam (the side of the cup) be well back under the arm so that the milk ducts under the arms are not cut across with a constricting inner cup piece. Similarly, the neckline edge should not pull tightly across the top portion of the breast.

- ***It should offer the breasts both separation and uplift/support.*** If separation and uplift are both physically and psychologically important to a woman at all other times of her life, they are especially important at the time just after childbirth when as an exhausted mother of a young baby, we have heavy lactating breasts. Supporting the weight of lactating breasts is just as important as offering our breasts adequate bra support at any other stage of our lives. A lactating breast is much heavier than a non-lactating breast, so it makes sense that to prevent the skin and breast tissue stretching/drooping under the influence of gravity, very supportive nursing bras must be worn i.e. ***uplift and support are even more important during the period of time when our breasts are heavier than normal.*** This is especially the case if we wish to retain firm, youthful-looking uplifted breasts for as long as possible. Many women complain that after finishing breast-feeding, their breasts 'sag'. Personally, I suspect that unsupportive nursing bras have played a large part in the development of this unsatisfactory situation.

To obtain uplift or support, a fairly snug, firm-fitting lower cup is invaluable. As a general rule, any give in the lower cup fabric should run vertically on the cup so that the weight of the breast will not be able to excessively expand the lower cup width-ways and uplift is maintained.

Allow me to digress a little. There seems to be a plethora of unsubstantiated 'old wives tales' and a ridiculous, unwritten 'let it all hang out' anti-bra type of foolish reasoning (i.e. 'go bra-less as much as possible') that all come into play as soon as a woman has a baby. Concerning the anti-bra lobby, I believe that as usual, it is the wearing of ill-fitting bras that causes the problems, not the wearing of bras per se. I believe that provided the volume of the bra cups is

adequate, blocked milk ducts and mastitis have much more to do with poor breast-feeding technique (exercised by the mother and/or the baby) than with the type of bra worn. When the baby latches on properly, milks the breast efficiently, and completely empties the breast, blocked ducts and mastitis are an unlikely occurrence.

Common sense has to prevail though. Some women are more prone to these types of problems than others, and if this is your situation, it is imperative to ***ensure that your bras have adequate cup volume and that there are no pressure points when wearing your bra.*** If you are having your first baby, and you don't know how your body will perform its breast-feeding role, then this is especially important.

- ***The outer cup should be easy to disengage*** so as to allow breast-feeding to take place, preferably using one hand if possible, and
- ***The bra straps should be made of very good quality strap elastic and the straps should join onto the centre back very close to the hooks and eyes.*** A lactating breast is much heavier than a non-lactating breast, and because of this, it is essential that the weight of these heavier breasts be well supported on the frame of the body. Wider strap elastic will spread the weight of the breasts over a larger surface area of the tops of the shoulders, preventing the shoulder straps from digging in. If the back strap attachment points are close to the centre back line of the body, the weight of the breasts will be supported a lot closer to the body's natural centre of gravity, encouraging good posture, promoting a better self-image and helping to minimise general fatigue.

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When compared to the number of styles of 'normal' bras available in the shops, there tend to be fewer styles of nursing bras available. Because the bra manufacturers offer fewer styles, they tend to design their nursing bras with very ***shallow shaped cups*** (instead of deeper, fully formed cups) in order to accommodate a greater variety of breast shapes. They also tend to use cup fabric that contains give, so that as the breasts expand throughout the pregnancy, and fluctuate in size whilst the lactation process is being established, the bra cups will be able to expand as needed.

This is all very well if your natural breast shape contains good uplift, if your breasts are firm and high set, and if your breast size doesn't go beyond a D. But unfortunately, if your breast size gets larger than a D, or if your natural breast shape is pendulous and droopy, the typical nursing bra will be an absolute failure in terms of breast support and separation and the ease and comfort of breast-feeding.

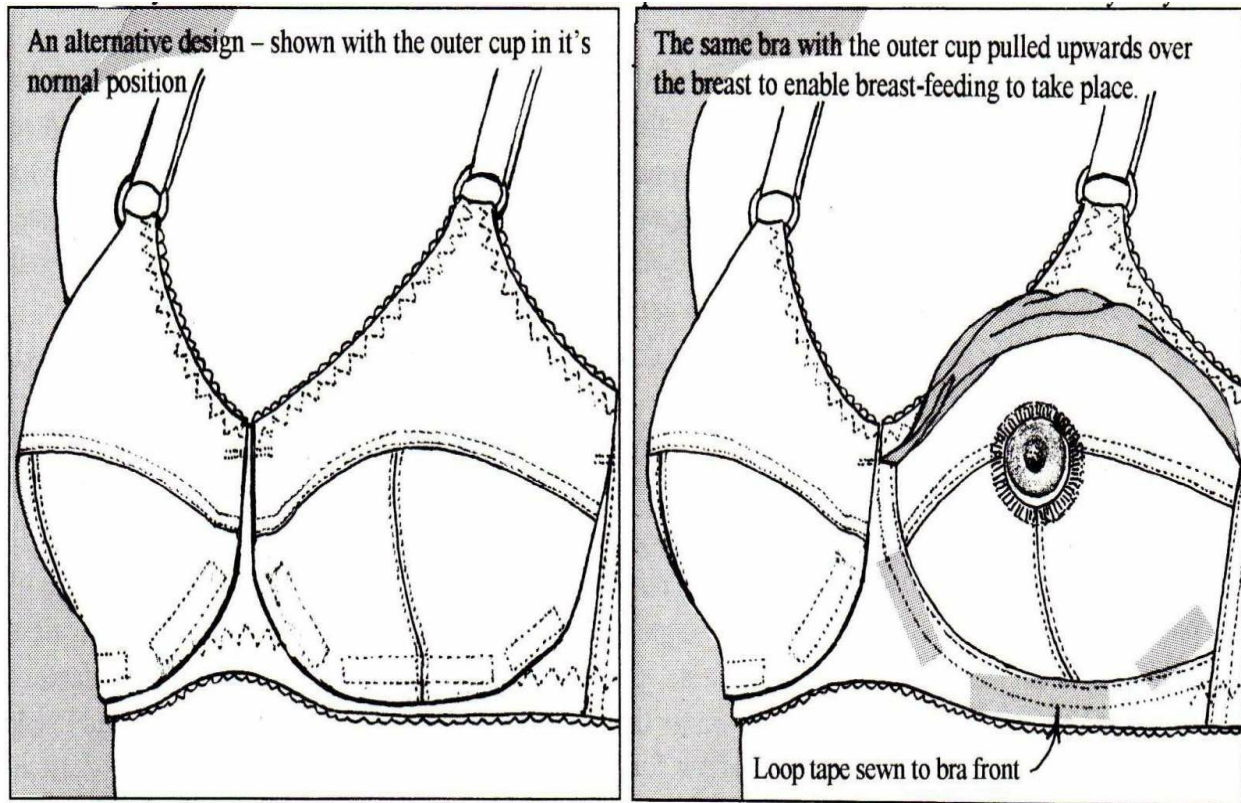
Concerning cup volume and breast surface coverage, in the case of the larger breasted figure (sized DD and larger), the typical shallow cups in a normal nursing bra will not be able to fully cover the surface of the breasts, and the breasts will be squashed together and flattened against the ribcage into a shapeless mass (which does little to lift the self-esteem of an exhausted nursing mum). This unsatisfactory situation can produce heat rashes, not only under the breasts, but also down the cleavage. To add insult to injury, when the cup is disengaged to allow for breast-feeding to take place, the sizeable breast is allowed to 'explode' out of the cup. When this happens, the breast obscures the baby, and if the nipple is at the tip of a large, pendulous breast, the nipple ends up in the baby's navel rather than in the baby's mouth when the baby is cradled normally in its mother's arms.

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Speaking personally, this was exactly my predicament when attempting to breast-feed both my babies. As a young mother, I found that I possessed the unworkable combination of large pendulous breasts, low-set nipples, a short torso, and short arms. The only 'solution' available to me at that time, was to lay the baby on my lap on a low cushion, lean over the baby, and position the nipple in the baby's mouth. Consequently, I always had a backache due to the discomfort of this stooped position, and could never discreetly breast-feed in public. I used to envy the other young mothers who could just hold their babies 'normally' and breast-feed. The embarrassment and discomfort I suffered robbed me of much of the contentment I should have been able to experience when breast-feeding my babies. One recent publication suggested that women in this situation use a sling similar to that which is used to hold a broken arm ... except that it should be placed under the breast to elevate the nipple to the height of the baby's mouth. My personal viewpoint is that this sling would be hot, bulky, and awkward.



The exciting solution to this problem has presented itself to me just recently. I have designed a nursing bra where each breast is enclosed in a two-layered cup. There is an inner cup and an outer ... both cup layers being practically identical, and joined together around the armhole and cup neckline edges (no clip at the top of the cup). Both cup layers are shapely/fully formed (so that each breast can fully descend down and out into its cup), and are comprised of non-stretch fabric in the lower cup (to retain uplift), and an upper cup fabric that contains low give (to allow for expansion). The outer cup's extended lower edge (which is hemmed) can be disengaged from the band under the cup (either narrow strips of 'velcro'/hook-loop tape or press studs can be used to join the two), and peeled upwards over the inner cup. The exposed inner cup (which still **fully supports the breast**) has a hole at its centre that is just large enough to expose the areola and the nipple to the baby, allowing breast-feeding to take place. Thus when breast-feeding, the outer cup is simply peeled upwards, and the baby is attached to the breast, the breast being in a fully supported, uplifted position. There is no bulky sling, and no uneven pressure exerted on the surface of the breast. The inner cup with its nipple/areola hole is especially beneficial if the nipples are inverted, as the nipple is encouraged/allowed to project forwards. This type of bra is illustrated in the following two diagrams. If there is a fear of blocked milk ducts caused by the fully supportive inner cup being worn whilst breast-feeding, then I recommend that this type of nursing bra only be worn once the lactation cycle has been established and the breast size has stabilised. Once the breast size has stabilised, a cup size that is on the roomy side can be selected so that the inner cu will not restrict the flow of milk in any way.



[page 179]

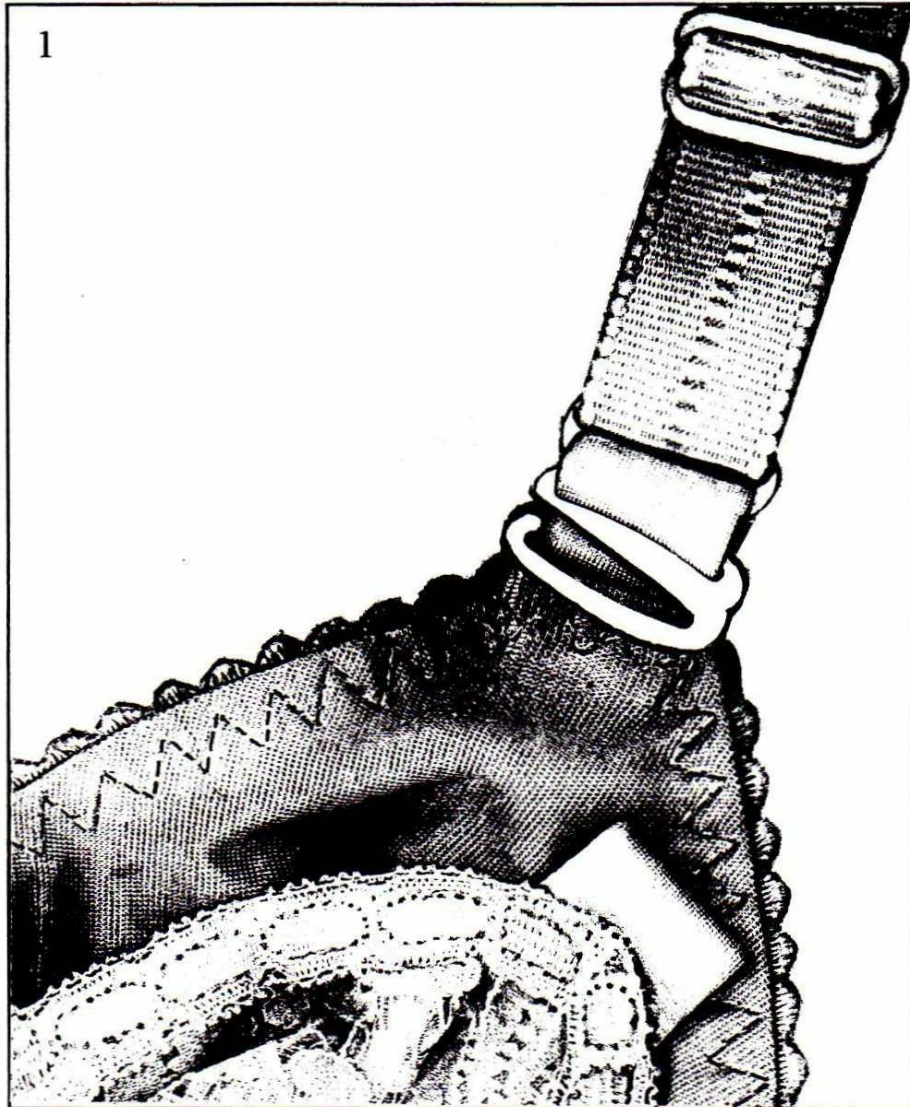
Because of the necessity of minimising the risk of blocked milk ducts, abscesses and mastitis, as a general rule, nursing bras should not be underwired. However, if a number of babies have been previously successfully breast fed, and these complaints have not arisen, if the breast size is very large and the mother in question would like to experiment with an underwired nursing bra in order to gain more support, then I see no reason why she should not be allowed to have an underwired nursing bra if she so chooses. I would stress that in this situation, the underwire needs to be a perfectly fitting shape and size so that there are no pressure points on the breast that are created by the wire. The field of nursing bra design is an area that could certainly benefit by an injection of creativity. I have yet to see a commercial nursing bra pattern available to the home sewer - which is not surprising, given that there are so few nursing bra styles for sale in stores. Hopefully the time will come when the home sewer will be able to choose from a wide range of commercial bra patterns (including nursing bra patterns).

Although it is imperative that nursing bras be a functional garment, aesthetics should not be totally sacrificed at the expense of functionality. Women who have a young baby are very often exhausted in the ongoing work of breast-feeding, changing nappies and serving their family and for them to feel alluring and beautiful in the midst of all that mothering is a wonderful tonic. Nursing bras should be as seductive, pretty and feminine as possible, whilst feeling wonderful to wear.

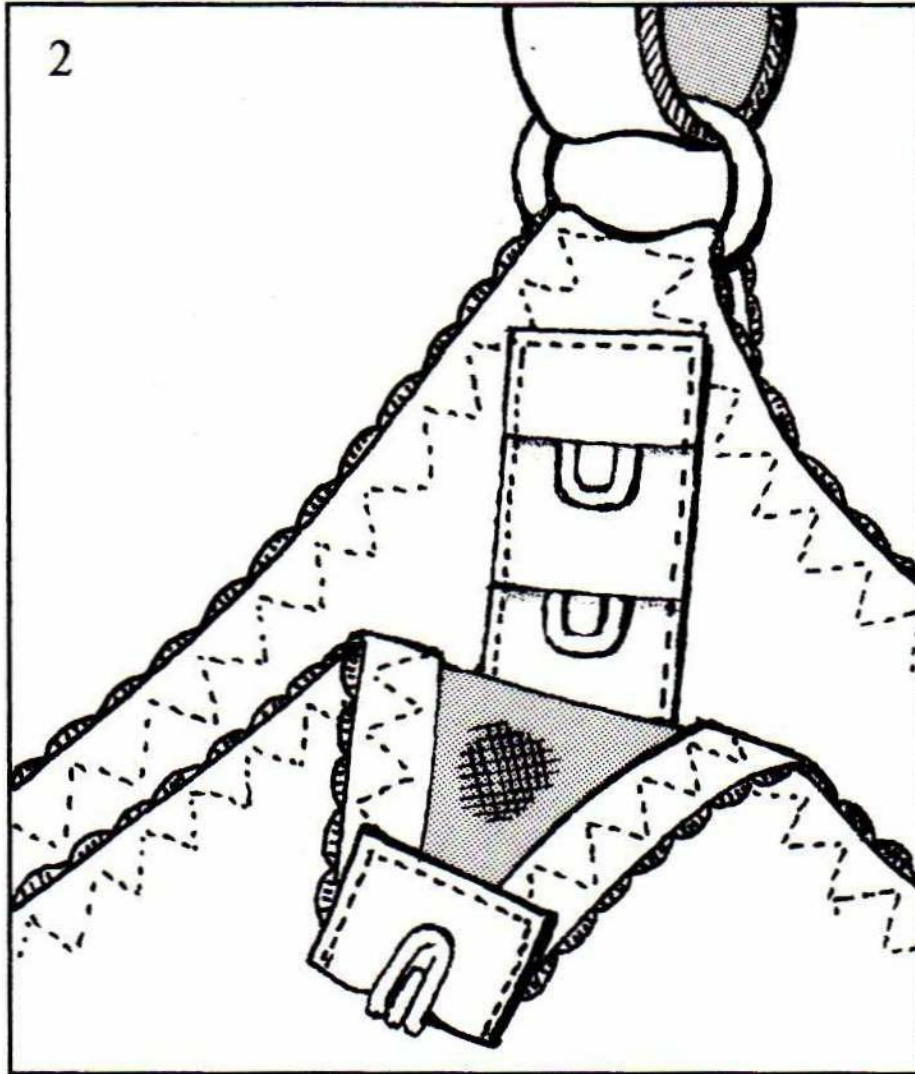
When making nursing bras, I suggest that the cups be lined with pre-shrunk, very fine, soft, cotton or poly-cotton knit (so that the cup fabric is absorbent of perspiration and milk leakage). Choose a lining knit that has only slight stretchability. If the cup's knit lining has excess stretchability, it has the potential to stretch too much, folding over onto itself creating uncomfortable, bulky folds of fabric.

If you are sewing a nursing bra, its design will probably incorporate some sort of release clip at the top of each cup that will allow the outer cup to disengage and be peeled away from the breast whilst maintaining the link between the strap and the partial cup. In a typical clip, the back portion of the clip provides a link between the underlying partial cup and the bra strap and the front portion links up with the interlocking part of the clip that is attached to the upper cup. There are many different designs in these plastic clips. I have found these plastic clips difficult if not impossible to obtain in Australia. Recycling clips from pre-loved nursing bras is always an option if these clips are your preferred choice but aren't available in stores. If using second hand clips, carefully observe the way they are linked up with the straps in the original garment, and only cut them off the original bra, one at a time. That way, confusion will not arise. Other options include:

- Using metal hooks that hook through a loop of non-stretch strapping that is sewn to the upper cup (diagram 1). Both the metal hook and the ring are threaded through a loop of non-stretch strapping that joins the partial cup piece to the adjustable strap. This option has the advantage in that the join between the cup and the strap is very strong.



- Using a hook and a bank of eyes (diagram 2). This option has an advantage in that it gives the nursing mother three adjustable positions that can be used throughout the lactation cycle. If the breasts are large, heavy-duty hooks and eyes (similar to those used on corsets) can be used.



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## General Sewing Instructions for a Nursing Bra

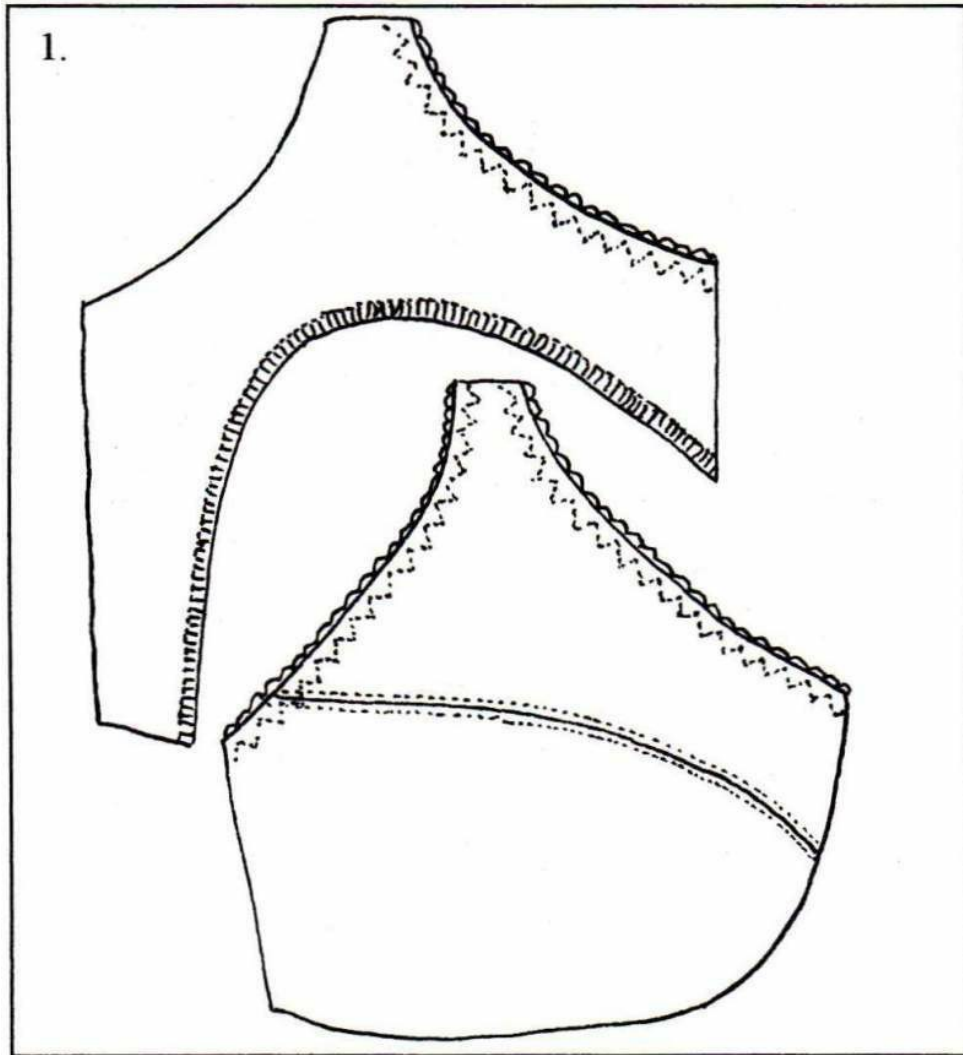
There are many different styles of nursing bras, and as with any other non-underwired bra, each style will have its own set of sewing instructions. Use the strategies found on [page 44](#) to formulate the order of the seams to be sewn/edges to be finished off. The order of sewing a nursing bra is basically the same as that for a non-underwired bra of a similar style, except for the inclusion of the underlying partial cup pieces which are sewn in behind the cups. These partial cup pieces are normally made out of Spandex or cotton lycra: so that the partial cup pieces will allow the breasts to expand without pulling tightly. If the stretchability of the fabric in these partial cup pieces produces a slack neckline edge, consider using bias binding and or edging



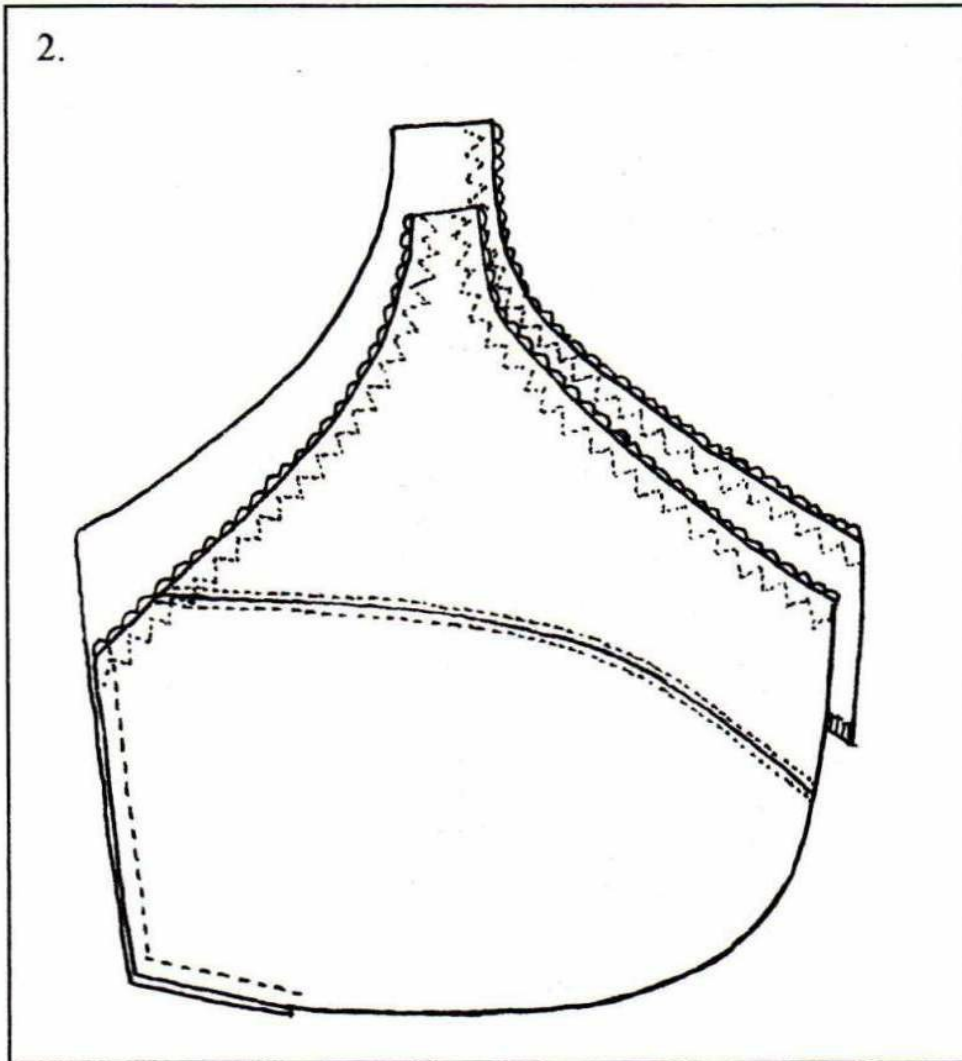
lace to reinforce the neckline edge, making it stronger and non-stretch.

When assembling a typical nursing bra that has a release clip at the top of the cup and a triangular underlying partial cup piece, the following instructions and sequence of diagrams can be worked through. They will show how such a bra comes together.

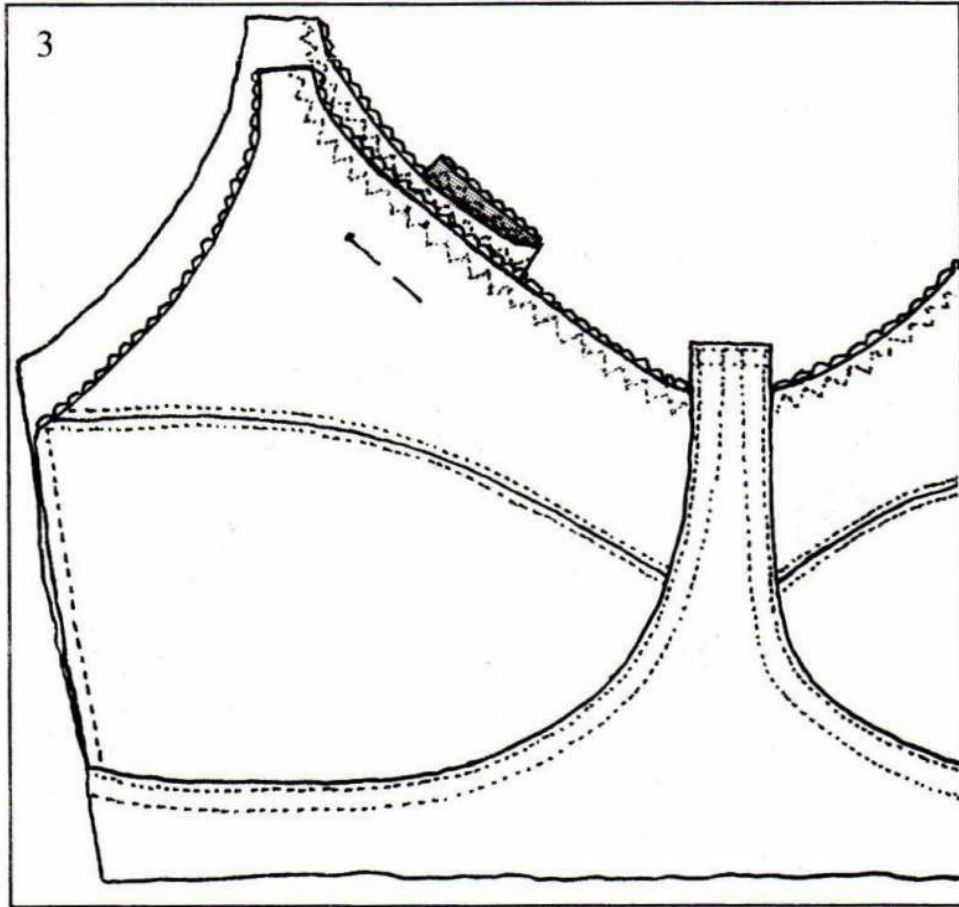
1. Each cup is assembled and its neckline edge finished with edging lace/bias binding/tape or elastic (depending on the way the neckline edge in the pattern bra is finished). Refer to [pages 99-100](#).
2. The armhole edge of each cup is finished with narrow scalloped elastic. Refer to [page 97](#).
3. The partial cup pieces are overlapped along their lower/inner edge and the top edge of the centrepiece is reinforced with tape and edging elastic.
4. The neckline edge of each partial cup piece is finished with edging lace or elastic. Diagram 1.



5. The cups and partial cup pieces are then treated as one. They are stay stitched together along the side seam and lower edge only. Ensure that there is the required gap between the top armhole edges of both pieces. Diagram 2.



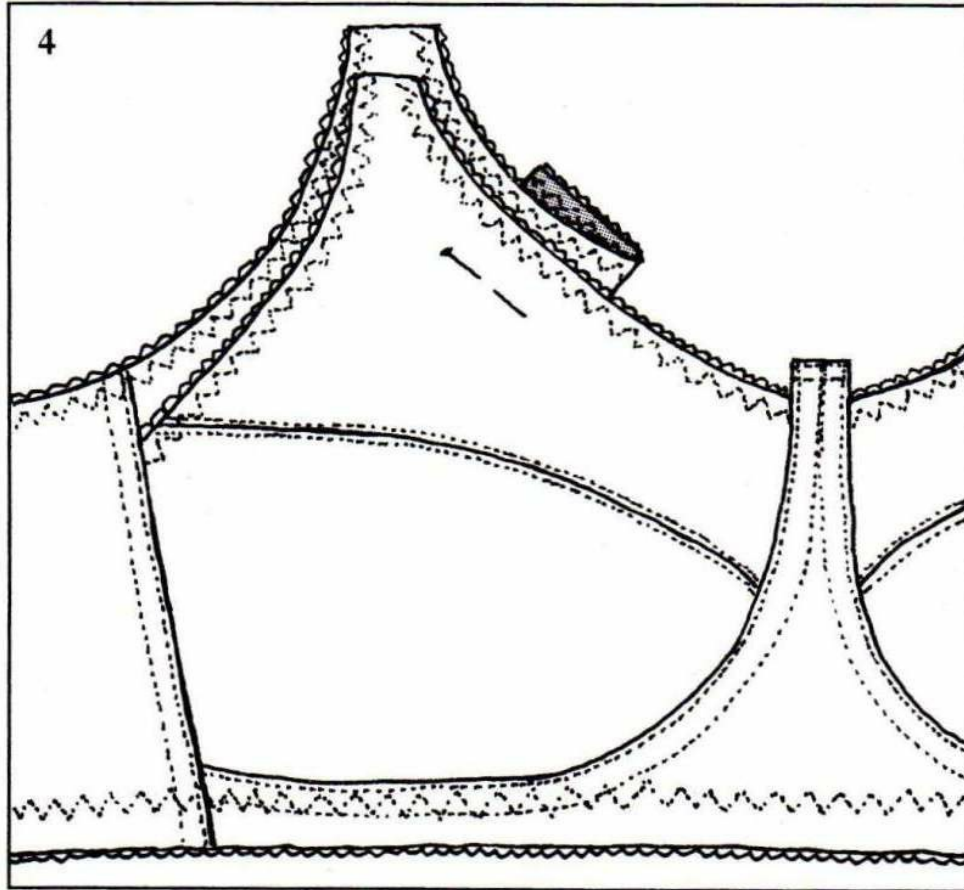
6. The cups are sewn to the centrepiece in their correct position. Note the lowered neckline edge of the cup in relation to that of the centrepiece. It is the neckline edge of the partial cup pieces that will be higher, level with the top of the centrepiece. Trim back the raw edge belonging to the centrepiece, turn all raw edges out of the cup and pin stitch and top stitch as shown. Diagram 3.



7. The completed bra front is sewn to the bra back (the side seams are sewn). Trim back the raw edge belonging to the bra back, turn all raw edges towards the back and pin stitch and top stitch as shown.

8. The total armhole edge is finished with narrow scalloped elastic (stretch the elastic a little the front of the armhole to ensure a snug fit).

9. The total lower edge is finished with unstretched wide scalloped elastic.  
Diagram 4.

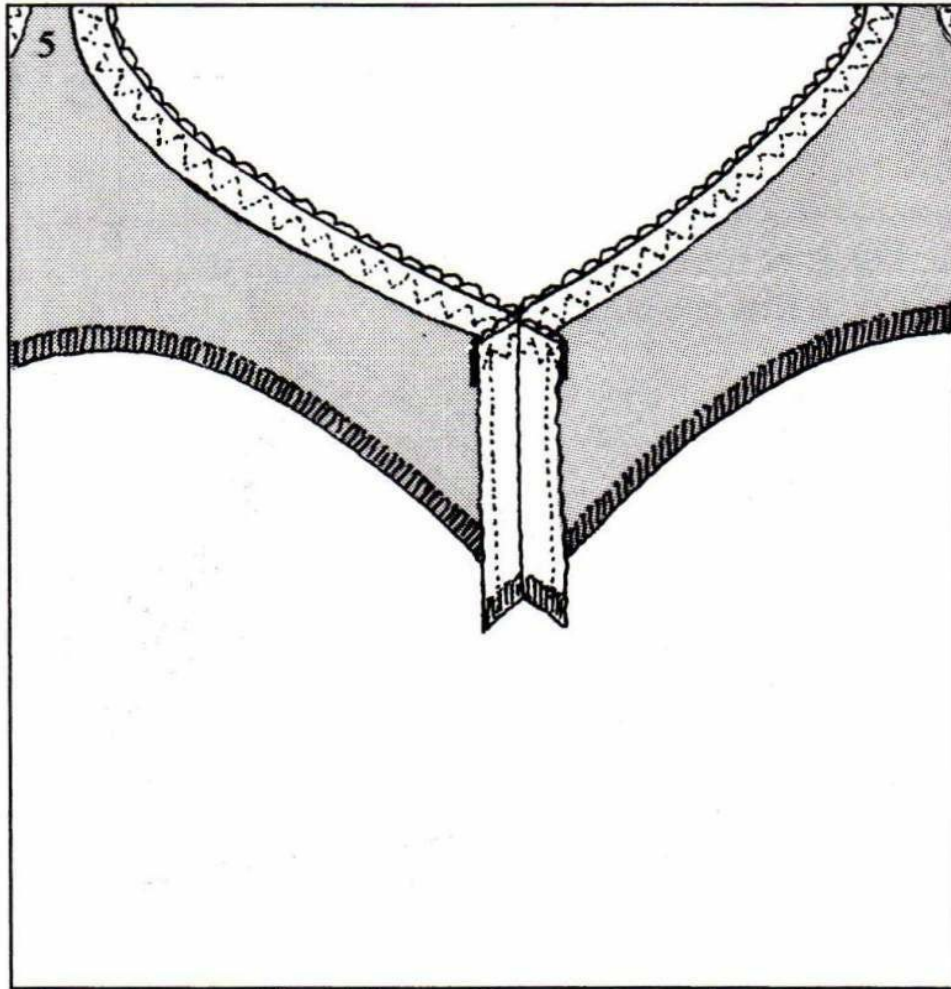


[page 181]

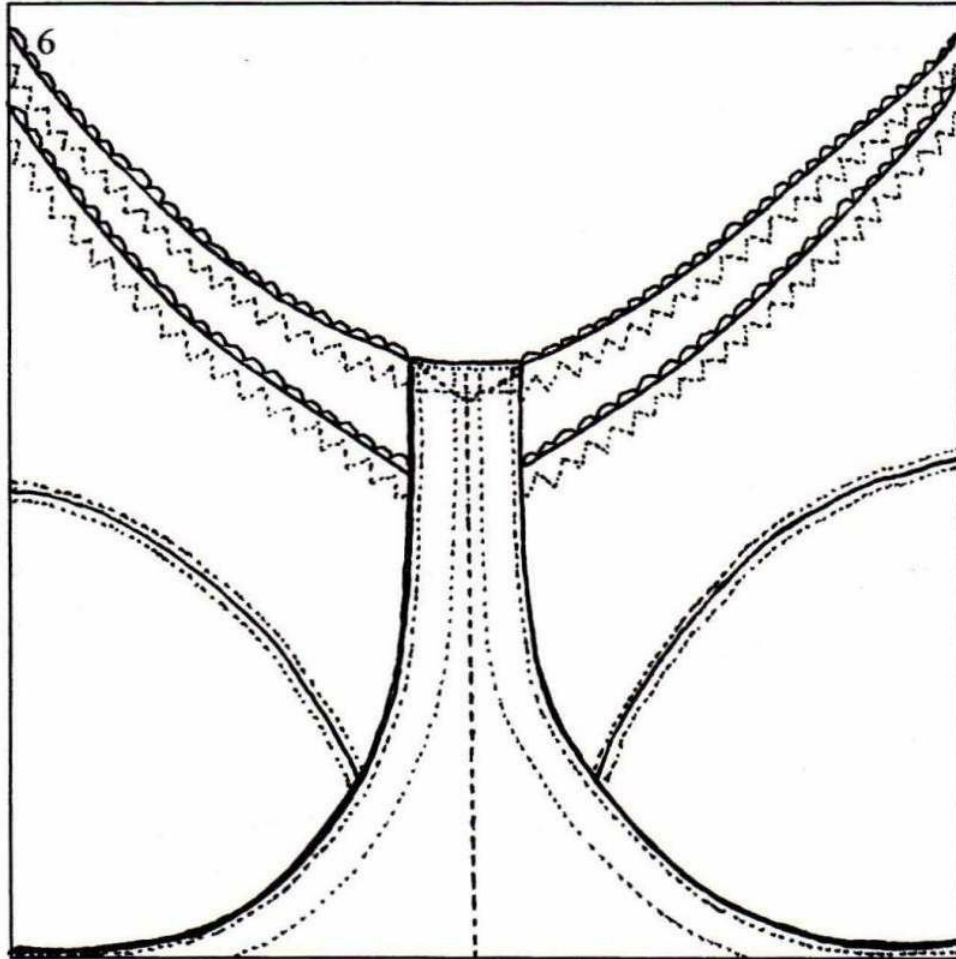
10. The adjustable straps are assembled, threaded through the ring/slide/release clip and then sewn to the bra back after checking the height of the closure tab. Refer to [pages 105-107](#).
11. The closure is sewn to the centre back raw edges. Refer to [pages 108-111](#).
12. The release clips are pinned into position and the bra is tried on to determine:
  - The size of the seam allowance to be used when the partial cup pieces are seamed together at the centre front. A snug fitting neckline edge of the partial cup piece is needed.
  - The amount of both the cup fabric and the partial cup fabric that is threaded through the spaces of the clip to ensure adequate uplift.
13. Sew the clip in its final position accordingly.



14. Sew the partial cup pieces together along the centre front, using a backstitch at the top of the seam. Part the raw edges and top stitch. Diagram 5.



15. Position the joined partial cup pieces in their finished position behind the centrepiece and sew securely along the centre front of the garment, sewing through all the fabric layers. Diagram 6.



16. Underwire casing, tape or bias binding can be edge stitched to the inside of the bra to conceal the raw edges around the cup.

17. Bow to centre front.

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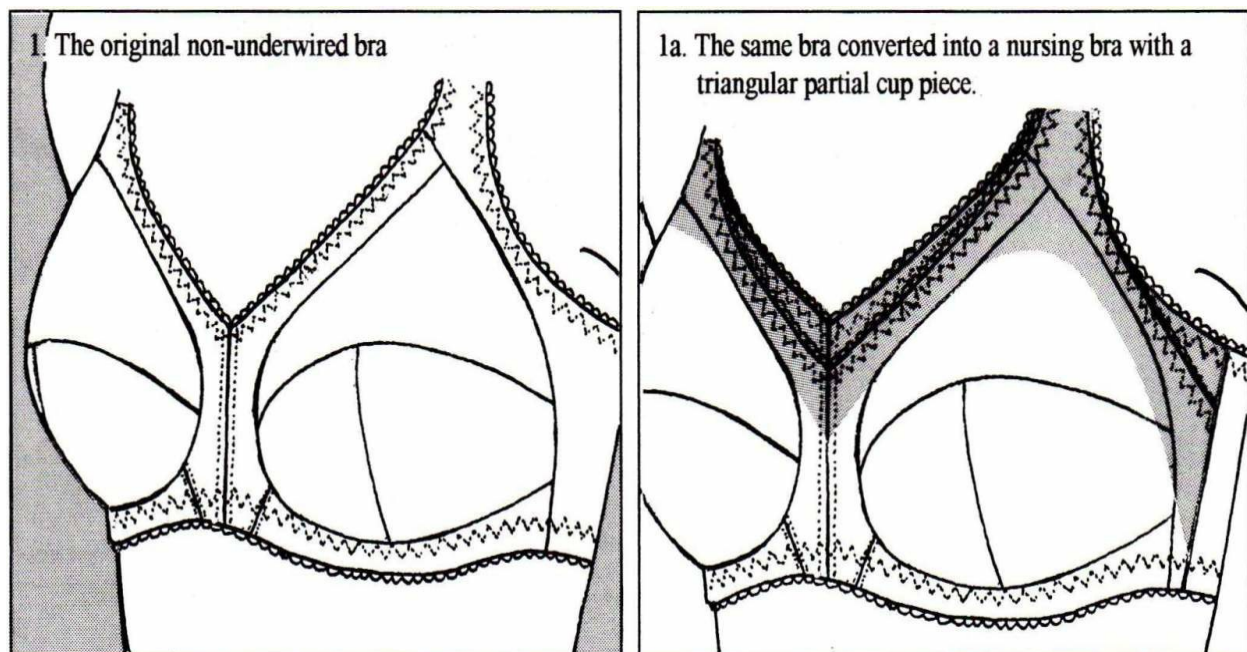
## How to Convert Your Normal Bra Pattern to a Nursing Bra Pattern

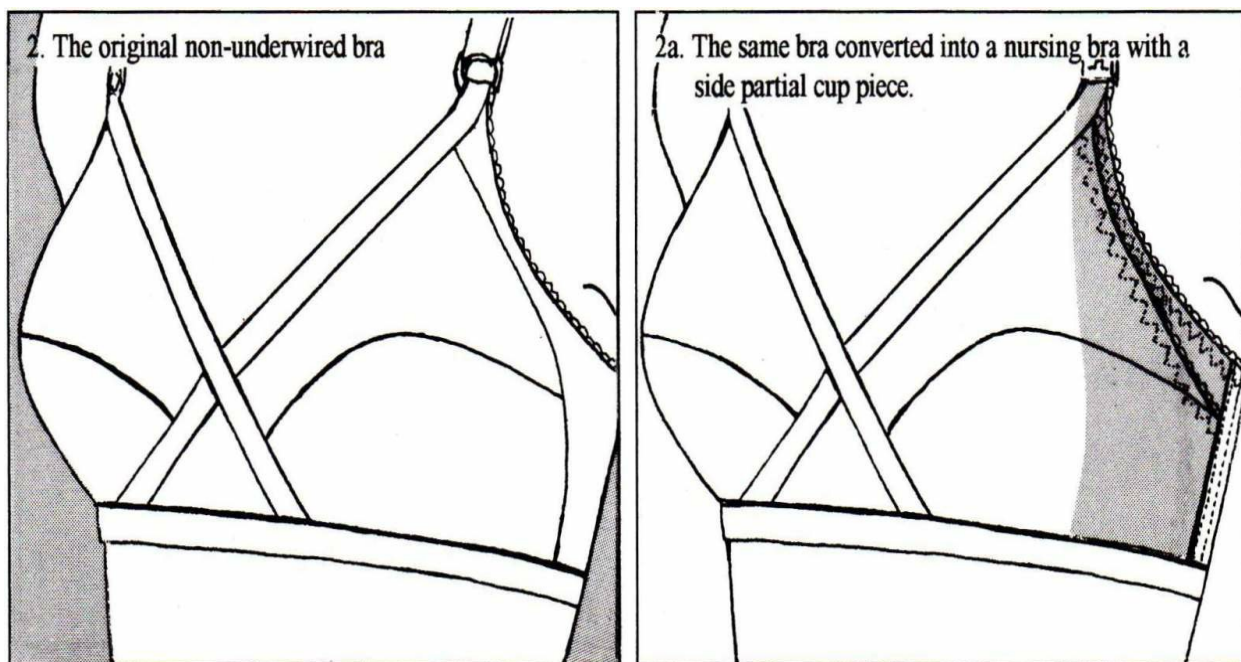
If you have a favourite nursing bra that you would like to replicate, you can use the non- underwired bra pattern drafting method found from [page 38](#) onwards, to produce its pattern. An extra pattern piece represents very little problem. Be sure to only cut up one cup, leaving the other cup intact to clarify how your cup pieces combine with the body of the bra.

Most non-underwired bras can be fairly easily transformed into a nursing

bra that has **a triangular partial cup piece, a straight side seam and a release clip/hook at the top of each cup**. Decide which nursing bra design you wish to produce. If you have no strong preferences, the type of cup design in the pattern bra can suggest the shape of the underlying partial cup piece to be introduced. If the pattern bra has a horizontal or diagonal seam across the cup, then I suggest that you convert it to a nursing bra with a triangular partial cup piece. If the original bra has a vertical mid cup seam, then it lends itself more towards a nursing bra that has a side partial cup piece.

Whichever style you select, **it is important to slightly lower the centre front and/or side edges of each cup** (depending on the style of nursing bra chosen) **so that the cup can easily be peeled downwards over the bulk of the breast to allow breast-feeding to take place**. The neckline and/or armhole edges of the underlying partial cup piece will be the height of the original neckline/armhole edges of the cup. The diagrams below left show a non-underwired bra. The corresponding right diagram shows that same bra when it is converted into a nursing bra. Note the lowered cup edge where the partial cup piece is underneath that part of the cup. The shaded areas indicate the partial cup pieces.

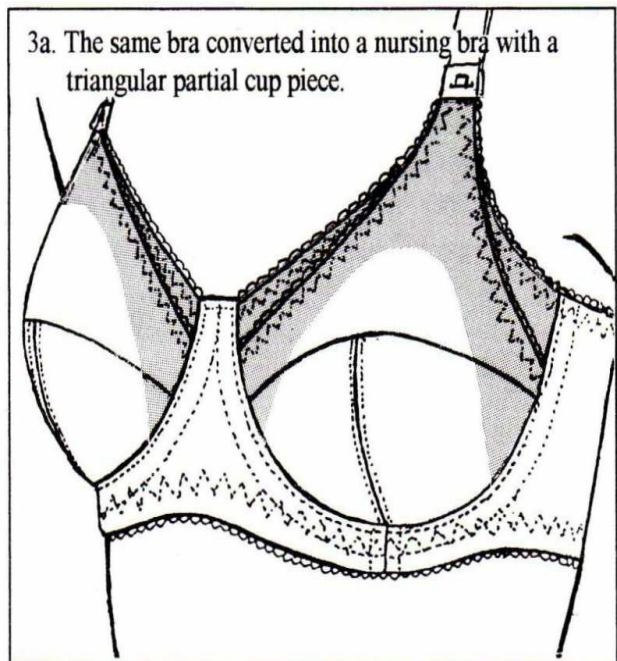
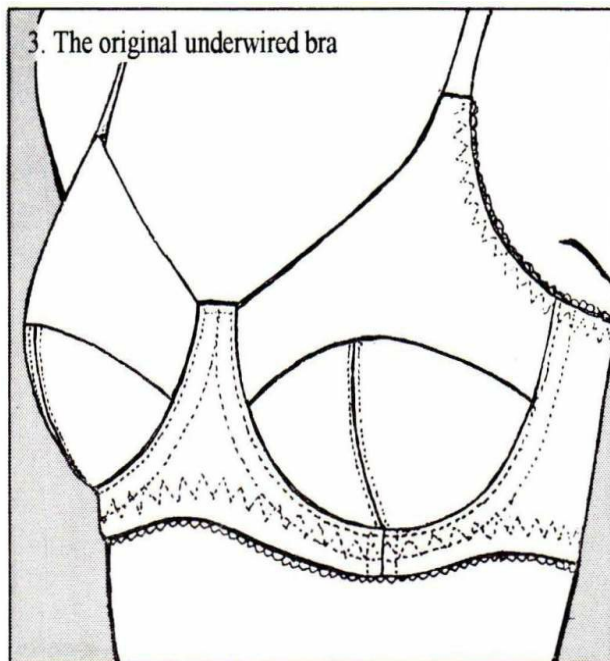
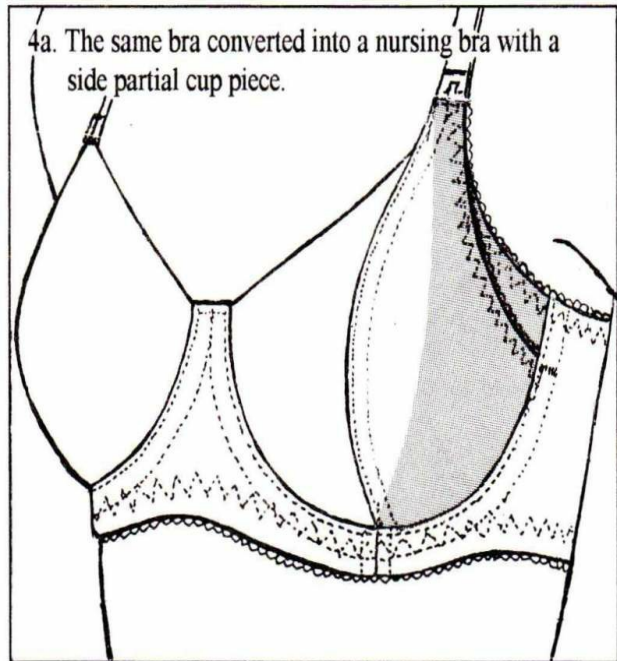
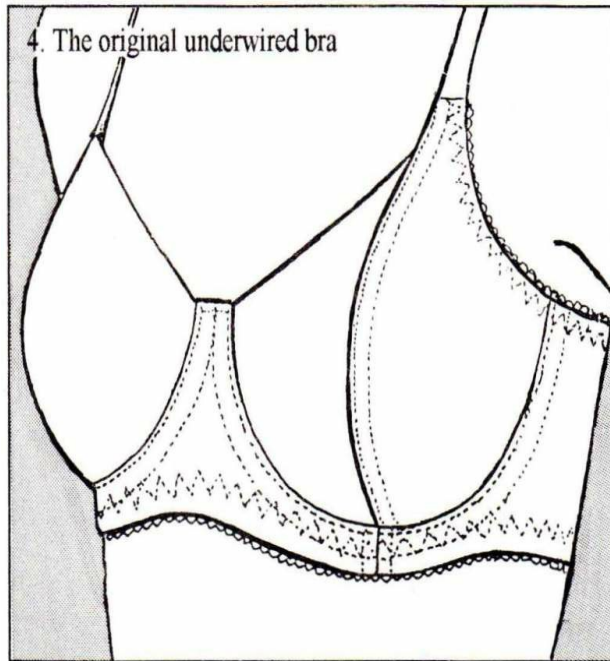




[page 183]

If you are in the unenviable position of being unable to find a nursing bra or a non-underwired bra that fits and supports your bustline, and you want to develop a nursing bra pattern, the solution is to select a certain type of underwired bra as the basis of your nursing bra pattern. **Choose a well-fitting underwired bra that has rigid/non-stretch cup fabric** (the more rigid the cup fabric or lace the better, as the shape of the cup won't collapse when the wires are removed). Underwired bras with rigid cup fabric are the only types of underwired bras that can still support the breasts reasonably well without their wires. Remove the wires from this pattern bra and try the bra on to ensure that without its wires, it still provides adequate support. When drafting its pattern and converting this bra into a nursing bra, **it is important to slightly lower the centre front and/or side edges of each cup** (depending on the style of nursing bra chosen) **so that the cup can easily be peeled downwards over the bulk of the breast to allow breast-feeding to take place**. The neckline and/or armhole edges of the underlying partial cup piece will be the height of the original neckline/armhole edges of the cup. The diagrams below left show an underwired bra. The corresponding right diagram shows that same bra when it is converted into a nursing bra. Note the lowered cup edge where the partial cup piece is underneath that part of the cup. The shaded areas indicate the partial cup pieces.





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## Strapless Bras

Because strapless bras cannot rely on straps to help defy gravity, they generally have to rely on the strength of their cup fabric and underwires that have fairly high tips in order to provide adequate breast support. The only offer mediocre support at best, and because of this, they are at their best

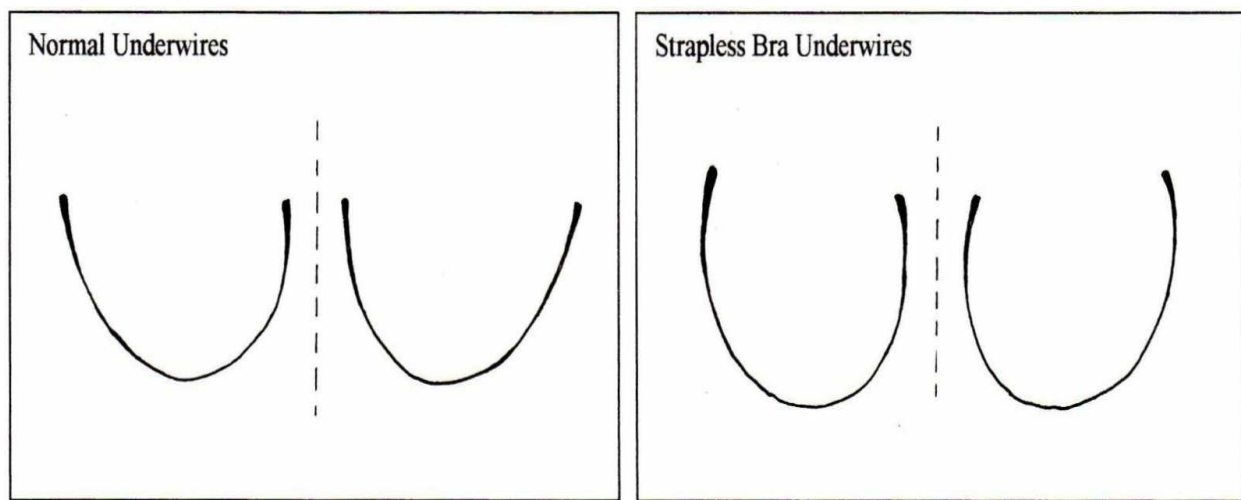


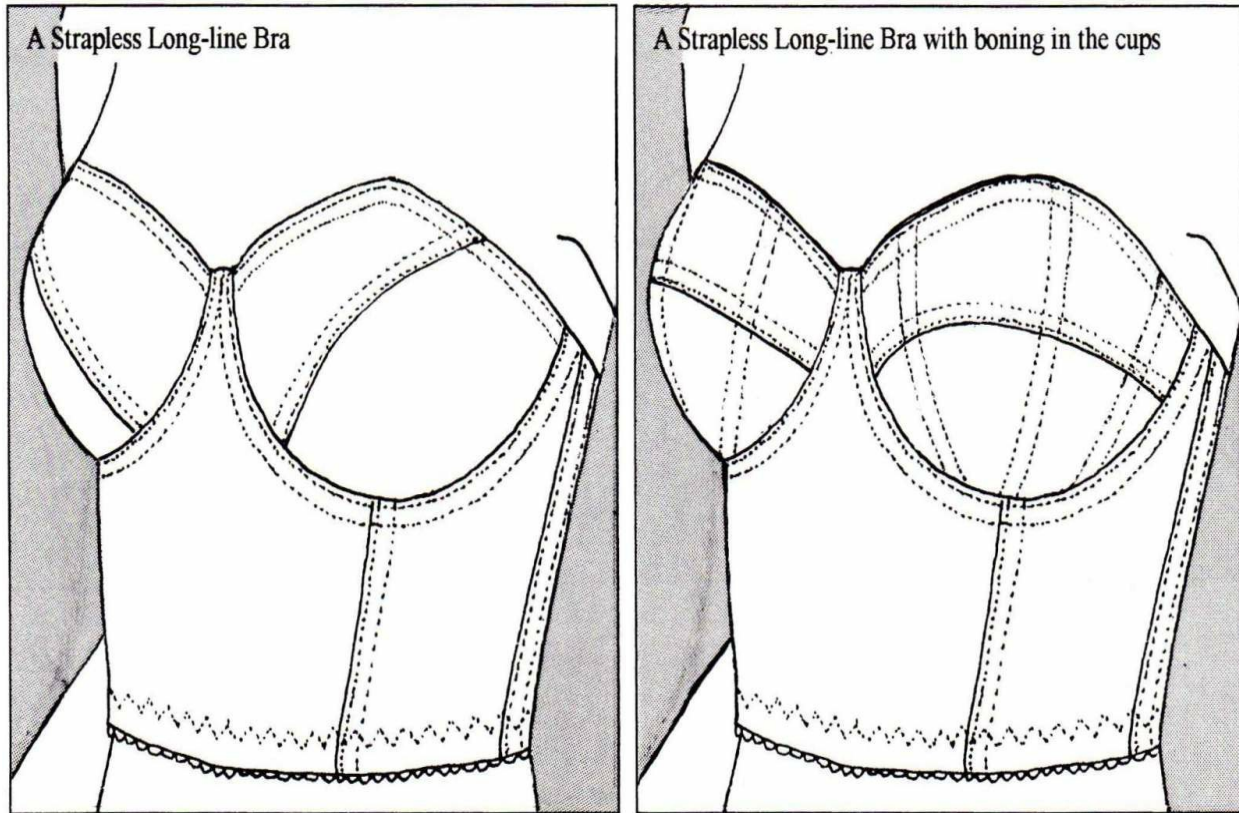
when the cup size is fairly small and the breast shape possesses natural uplift.

A close analysis of the type of underwires in strapless bras reveals that their shape is slightly different from normal. Strapless bra underwires don't splay out at the top as 'normal' wires generally do. Instead, their upper tips continue around the breast and even come inward slightly at the top. They also seem to be higher wires, similar to a horseshoe in shape.

To prevent strapless bras from slipping downwards on the torso the manufacturers use various design techniques as well as specialised elastic around the edges of the garment called '***grip' plush lingerie elastic*** (which has loops of exposed rubber across the felt side of the elastic). The rubber loops grip' the skin to keep the bra in the correct position on the body. They also use ***boning*** in the vertical seams to encourage the top of the bra to maintain its position (both the side seam and any seam under the cup). Soft polyester boning can even be used in the cup itself if the cup size is quite large. The design of the bra is often a long line bra. The longer line bra body prevents the cups from falling downwards on the torso.

If making a strapless bra, you can alter your pattern so that the cups have a slight peak at the top of the upper-cup, a higher centre front and a 'scooped' back (if desired). Unless you are recycling wires, you may have to use normal wires as these specialty wires may be difficult to obtain, as could the special 'grip' elastic with its lines of exposed rubber.





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## Long-Line Bras and Bra Body Suits

Long-line bras vary from normal bras in that the bra back and the centrepiece are extended downwards, until they almost reach the waist. If you wish to convert your normal bra pattern to a long-line bra, simply add the appropriate depth to the lower edge of these two pattern pieces. An extended centrepiece bra is ideally suited to this conversion, as bones can be sewn into the side seams on the bra body. Keep in mind that you will need a much longer closure at the centre back and will need to be able to purchase hook and eye closure tape by the metre.

Long-line bras can be easily adapted to become bra-tops (e.g. adding a skirt/flounce around the lower edge) which when worn over slacks or a skirt can produce a very stylish outfit.

Bra Body Suits are long-line bras and knickers/corsets in one garment. There is no closure at the centre back and there is generally a closure (hook and eye) at the crotch. The body of the garment is made from spandex,

powernet, lycra or stretch lace. For the garment body, it is essential that the spandex, powernet, lycra or stretch lace be cut out correctly: with the direction of greatest stretch going around the body. If extra firmness is desired when worn, the spandex or power net can be doubled in the back or front, or both. Very often, there is a 'control' panel sewn into the centre of the front panel. This is an area of the body suit that possesses reduced horizontal stretch in its fabric: often produced by having the fabric in this panel cut out with the direction of least stretch going around the body. If the shoulder straps are made using one long piece of strap elastic, the mid-point of this length of elastic is positioned at the centre back.

When drafting a pattern for a body suit, I recommend that you take a pattern from an old body suit. Closely observe this pattern garment to determine the order of sewing. All the principles of garment construction in this book apply to this garment as well. If your body suit is underwired, then treat your garment simply as an underwired bra. The centrepiece will extend downwards into the front of the suit. Similarly the bra back will extend downwards and become the back of the suit.

It is important that the cups do not stretch apart on the body when the suit is worn: so, if the non-stretch control panel does not extend upwards in between the cups, you should insert a non-stretch piece of lining fabric in between the cups. This piece of lining fabric will be wedged in between layers of fabric and will be sewn in position (between the cup spaces in the suit body) before the cups are inserted into the body of the suit.

Elasticise the leg openings in exactly the same way as you would in a pair of panties, incorporating a gusset piece (made from an absorbent knit fabric) and the closure at the crotch as well. Most body suits have a centre back seam to allow for more contouring or shaping so that the suit hugs the body very closely.

***When sewing the side seams and the centre back seam, it is important to produce strong, yet flexible seams.*** If you are using an overlocker/serger to sew these seams, I suggest using a three-thread overlocking stitch, using woolly nylon thread on the loopers and slightly loosening your stitching line tension.

If you wish to sew these seams using your sewing machine:

- use a **good quality stretch needle** (preferably a new needle),
- use a **small straight stitch** (so that afterwards the raw edges can be parted and top stitched flat),
- **loosen the upper thread tension slightly** (so that the line of stitching can be stretched without the thread breaking) and
- **stretch the fabric a moderate amount as the seam is being sewn** (this will ensure that your line of stitching will not break when the garment is worn). Once these seams are sewn in this way, the raw edges can be parted, and a very wide three-step zig zag or serpentine stitch can be sewn across the seam line. The raw edges can be trimmed back to the line of stitching. If extra strength and garment life is required, I suggest that a single piece of non- bulky narrow elastic be edge stitched over the seam on the inside of the garment. Use a tiny zig zag down each edge of the elastic.

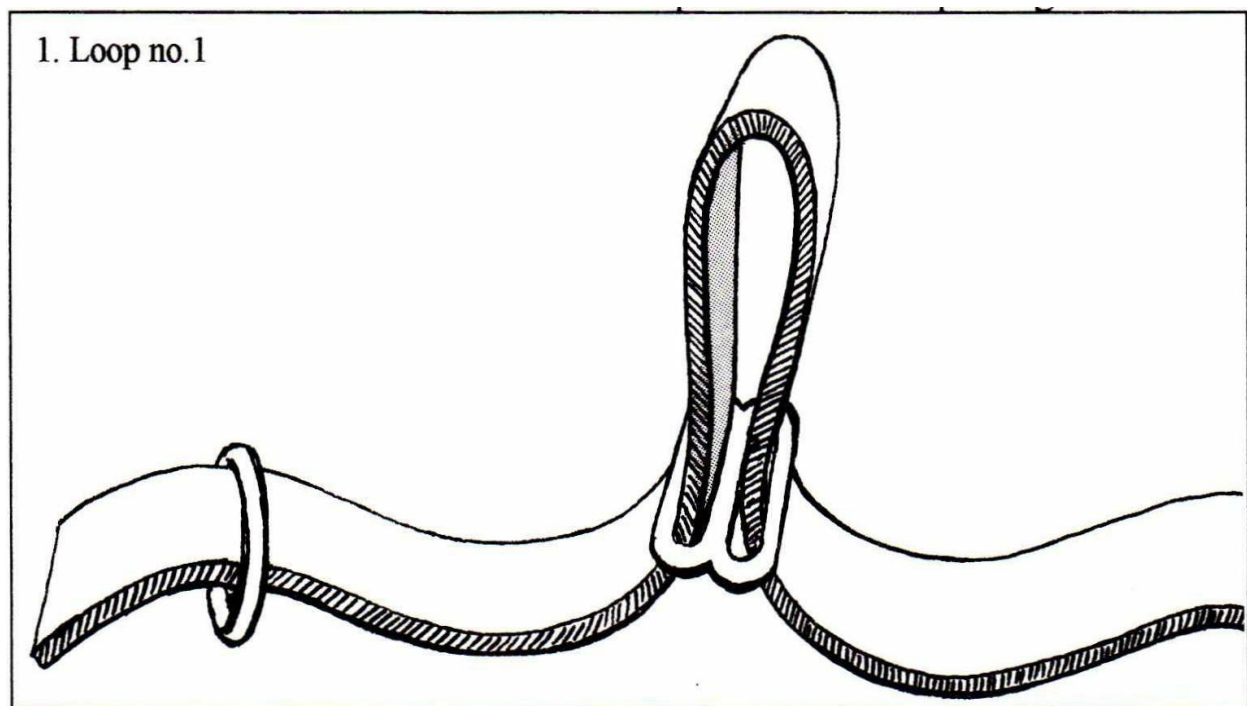
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If the straps of the body suit are front adjusting and are comprised of one long piece of strap elastic that is sewn to the centre back half-way, measure the length of the piece of strapping needed and cut a piece accordingly. Mark the middle point on the length. **Sew only one ring** (ring number 1) **to one of the upper cups** (leave the other ring free). Assemble one end according to instructions on [page 105](#), **threading the strap through the ring that has been sewn to the upper cup**. You should now have one very long adjustable strap.

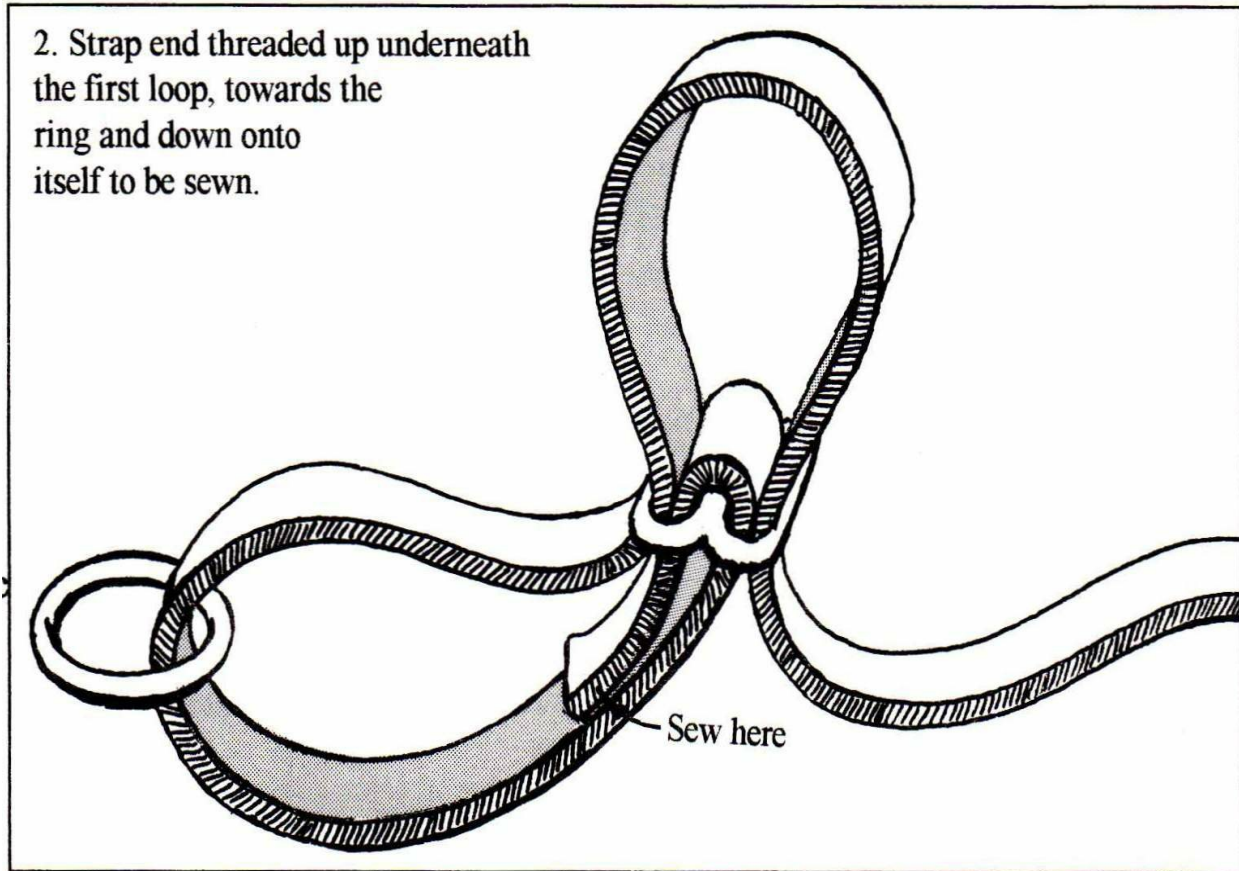
Ensuring that the strap is not twisted, sew the mid-segment of the strap to the top edge of the back, sewing it to the raw edge that leads down to the centre back seam (align the middle point on the strap with the centre back seam). Trim back the excess fabric that lying underneath the top half of the strap. Thread the other strap end according to the following instructions. (The shaded area in the diagrams represents the underneath surface of the strap).

Note: thread the strap very **loosely**: especially when the strap goes under or over a bar of the slide!

- Thread the strap end: **up** through the back space of the slide,
- **over** the central bar,
- **under** the front bar (this creates loop number 1 ... keep very loose!) then
- **downwards through the free ring.** Diagram 1.
- **back up through the back space** of the slide (under the very loose loop number 1) And changing direction ...
- **around the central bar and back down onto itself** (the raw end of the strap is wedged in between the two strap sections). Tighten loop 1 and in the process loosen loop 2 as much as possible, and then sew the end of the strap back onto itself (sew the raw end to the section of the strap that will end up being next to the body in the finished garment).
- Lastly, ensuring that the strap is not twisted, thread the other upper cup through the free ring and sew securely.







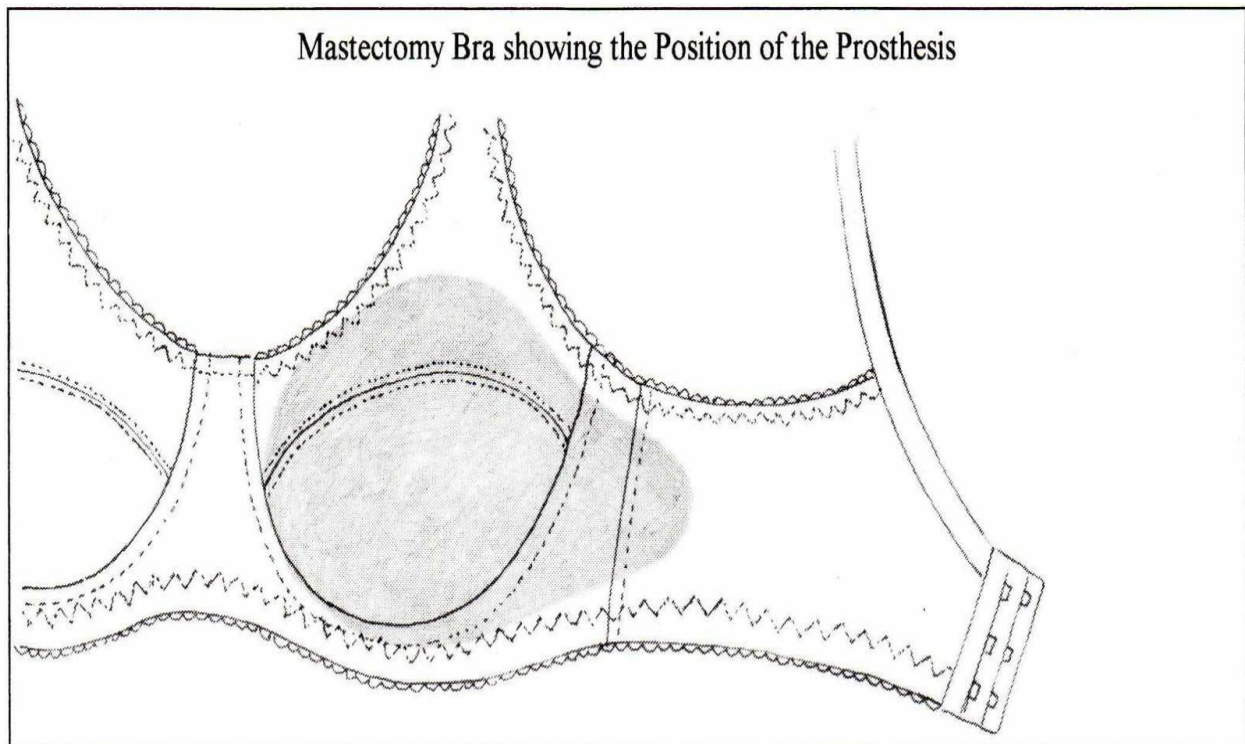
Once a body suit is made, I always sew a length of tape or narrow ribbon to the gusset's closure tab (the very lowest point of the back of the body suit). This makes it easier to get the hooks and eyes done up on the garment: the tape can be easily passed through the legs and then by pulling on the tape, the gusset can be brought forward and the hooks and eyes done up. The length of tape can be tucked under the leg elastic along the front of the leg opening.

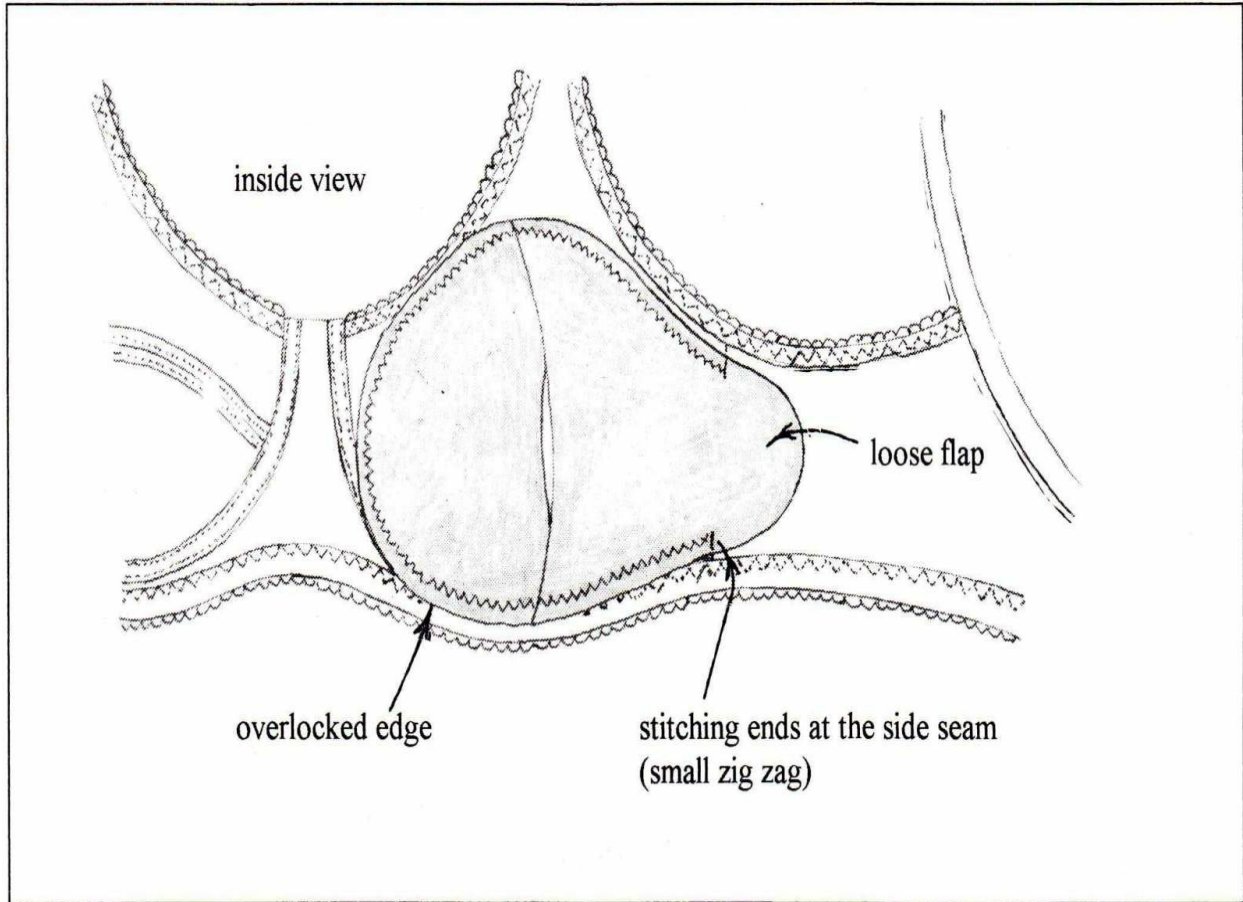
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## Mastectomy Bras

These bras have all the characteristics of a regular bra, except they differ in a few ways in order to fully accommodate a prosthesis (or breast form). A full breast with all its milk ducts and lymph glands is much larger than many women realise and a prosthesis therefore, extends higher up the torso and further out under the arm than may be expected. For the wearer to feel secure, knowing that the bra will keep the prosthesis from moving, the style

of the bra has to have quite a high centre front and side. Mastectomy bras are generally non-underwired but depending on the individual and the shape and size of the prosthesis, it is not an impossibility to make an underwired mastectomy bra. Even so, I would recommend making them **non-underwired**, as the non-underwired bra would be much easier to adapt to this specialised use. To hold the prosthesis in place, a pocket at the back of the cup, made of two soft pieces of knit fabric needs to be sewn to the bra, slightly overlapping where the two pieces meet at the top and the bottom.

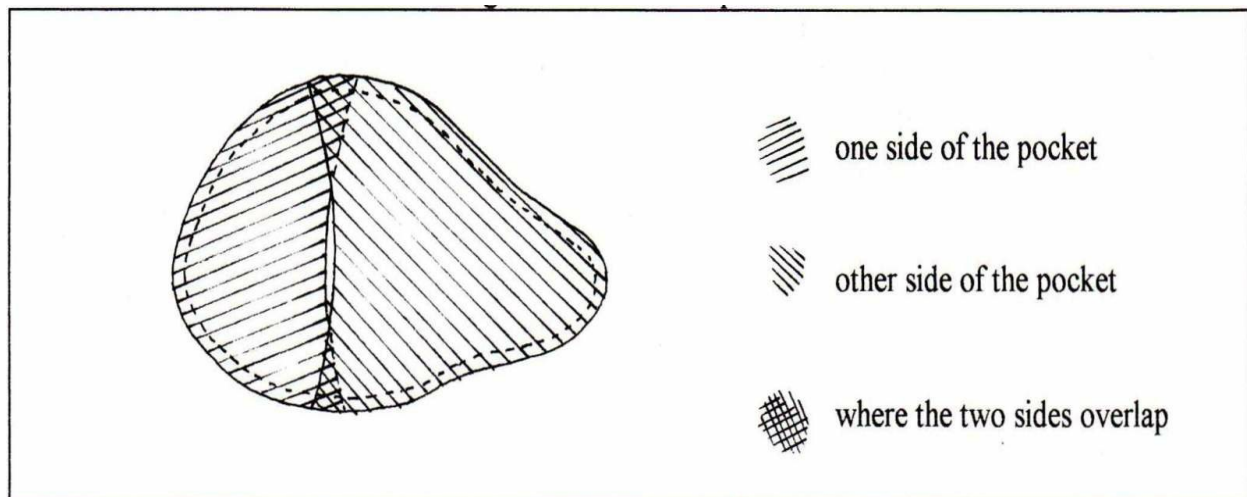




[page 188]

If you wish to convert a normal bra to a mastectomy bra, then all that is generally necessary is to sew the pocket behind the cup, however you may have to increase the height of the centre front and sides of the bra.

To make the pocket, trace the prosthesis as it sits flat on some tracing paper or tracing fabric. Add one centimetre all around to allow for sewing and divide the shape thus:



Where the shape of the pocket extends beyond the side seam the sewing is discontinued so that the pocket fabric does not interfere with the stretchability of the spandex or powernet in the bra back. Because of the shape of the prosthesis, it cannot move towards the back of the bra, making stitching onto the side back unnecessary.

If you are making an underwired mastectomy bra, complete the bra as if you were making a standard underwired bra, then overlock/serge the outer edges of each part of the prosthesis pocket, sew them together where they overlap, and then hand-stitch the outer edges of the completed prosthesis pocket to the underside of the bra.

Mastectomy bras both can, and should, be as attractive and alluring as any other bra. If the pocket fabric is flesh-coloured and the prosthesis itself is flesh-coloured, there is no reason at all why the cups can't be made using transparent lace! The only limiting factor is the personal tastes and confidence of the lady who will be wearing the bra.

## Push-Up Bras

Push-up bras are designed to enhance cleavage and apparent bust size. They push any available breast tissue upwards and inwards, producing an attractive fullness in the upper cup and above the neckline edge. A push up bra's lower cup is nearly always heavily padded. To obtain more vertical 'push' extra lower cup padding is often produced by an elliptical padded form that is inserted into a gauze pocket situated in behind the lower cup. A heavily padded side cup area, coupled with front strap attachment points that are situated fairly close to the arms, serve to push the breast tissue



inwards, creating a more noticeable cleavage.

These types of bras are most often available in A, B or C cup fittings (for obvious reasons).

If you wish to make this type of a bra, then refer to [page 95](#) for background information, and to [pages 144-146](#) for a padded bra's general sewing instructions. To make the neckline low cut, you may need to use half-cup underwires (these have noticeably lower tips than those in full-cup wires).



[page 189]

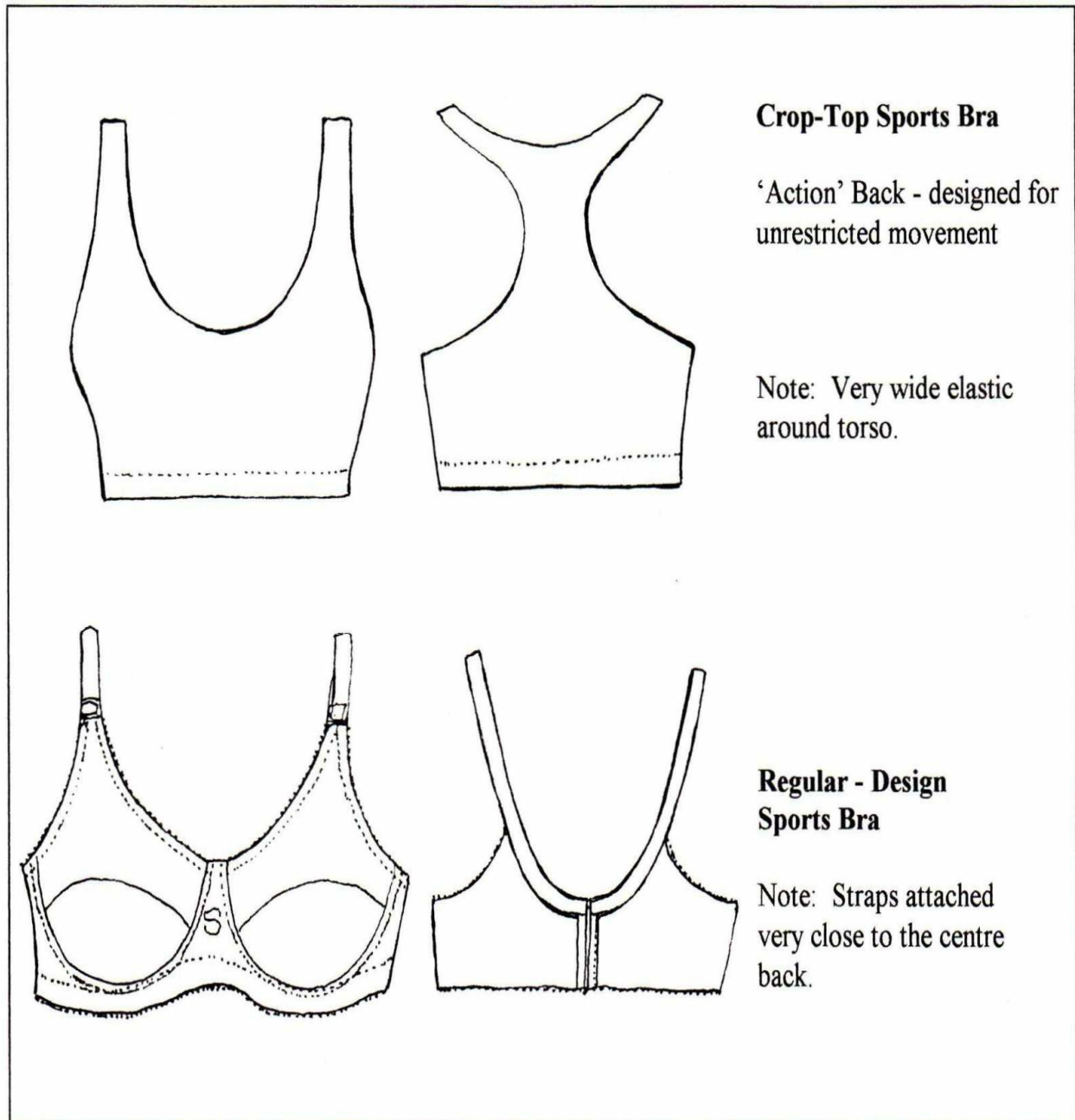
## Sports Bras

Sports bras are designed to be very supportive, functional bras that will hold the breasts firmly against the torso during periods of vigorous physical activity. They may be underwired or non- underwired and are generally plain-looking bras (with no ornate lace). The bra front is nearly always lined with fine cotton knit (to increase absorbency and comfort) and the bra straps tend to be wider and stronger than usual in order to reduce the



'bounce' factor. They often have a narrow panel of stretch/lycra netting around their cups, which is an inclusion aimed at increasing air circulation and the evaporation of perspiration. Their most important feature is the bra back: which is especially designed so that the shoulder straps will never slip over the shoulders (regardless of how vigorous the sports activity is), as well as providing the arms with unrestricted movement. The bra back is designed so that ***the back strap attachment points are positioned very close to the centre back***. This same design feature can thankfully be applied to any other type of bra, so that when we make bras, we can obtain all the beauty of lace and colour, but have a very functional bra at the same time! Sports bras can be regular types of bras, or they can sometimes take the form of an aerobic exercise 'crop-top'.

'Crop-top' sports bras are nearly always made of cotton lycra and are often fully self-lined, being comprised of two layers of cotton lycra. Crop tops act more as a binding/bandaging to the breasts and because of their undifferentiated design, they offer larger breasts very little support. As such, crop tops should only be worn if the breast size/cup size is fairly small.



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## Minimiser Bras

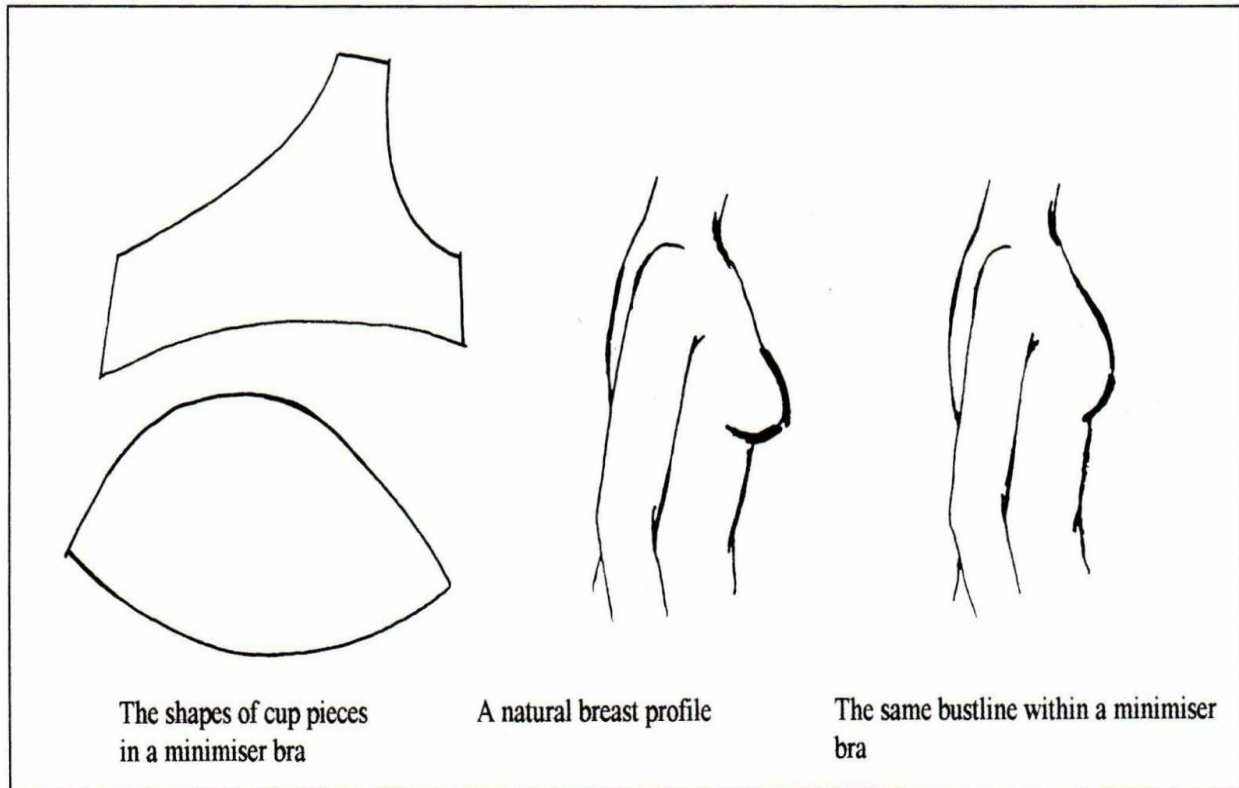
Minimiser bras, as their name suggests, are designed to 'minimise' the apparent size of the breasts: in essence, they **reduce bust projection**, holding the breasts closer to the chest wall than do other styles of bras. In a minimiser bra, the shape of the cup is such that the breasts are compressed inwards against the rib cage (against the body) - similar to the way English

Elizabethan court gowns flattened and compressed the breasts. To visualise this effect, imagine wrapping a female torso firmly with very wide bandaging, beginning at the waist and ending under the arms. Instead of pointed, protruding breasts, the resultant appearance are firmly-held mounds - a wonderful, youthful effect for women who naturally have pointed, droopy breasts or who may wish that their bustline was a few cup sizes smaller.

The secret that explains the way a minimiser bra works is in the shallow shape of the cup. Invariably, the lower section of the minimiser cup (below the nipple line) is both wide and very deep, (vertically) and the upper cup is fairly shallow (vertically). Because breast tissue is soft and mouldable, it will to some extent assume or fill the shape of whatever shaped cup is held tightly against it. As a result of the overall shallow shape of the minimiser cup, the breast cannot protrude and is forced inwards and 'flattened'.

Minimiser bras are mostly underwired, and because the breasts are 'bandaged' to the torso by the bra, the centre front section of the bra often doesn't sit in against the sternum: the central tips of the underwires tend to protrude or poke out. This can be a very annoying aspect of minimiser bras. Breast bulk has to go somewhere: it doesn't automatically disappear, and when the breasts are held in so firmly against the chest wall, the breast volume is forced upwards, outwards, and downwards. sometimes producing bulging under the arms, fullness above the upper cup, as well as skin-against-skin under the breast. Because there is skin against skin where the breasts are pressed downwards against the front of the chest, heat rashes and fungal infections can easily occur when the climate is a hot one, and when the skin is sensitive.

In my experience, women either love or hate minimiser bras, and the women who love them the most are those who find the size of their breasts both cumbersome and embarrassing.



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## Front Opening Bras

Front opening bras are often sought after by women who have health problems (e.g. Arthritis in the fingers, arms) or who want a bra with a full vest-like back (to play sport in for instance). Concerning women with arthritic hands, the sad fact of the matter is that unless the fit of the front opening bra is quite loose around the ribcage, (with the bra back being made out of quite spongy spandex or powernet), a front opening bra can be just as difficult to do up for these women as is a regular back opening bra. Larger breasted figures in particular, find it difficult to do up a well-designed front opening bra, as their breasts demand a high level of support (that can only be given by a firm bra back that will not ride up). The firmer the fabric in the bra back, the more difficult it is to do up the hooks/eyes at the centre front. Larger breasted arthritic women would be better advised to use regular back opening bras, and when they put their bra on, they should put it on back-to-front, do the closure up whilst it is in front of them, then swing the bra around until it is correctly positioned on the body, lastly pulling the shoulder straps upwards. The use of talcum powder can help the bra slip

more readily around the torso if this is a problem.

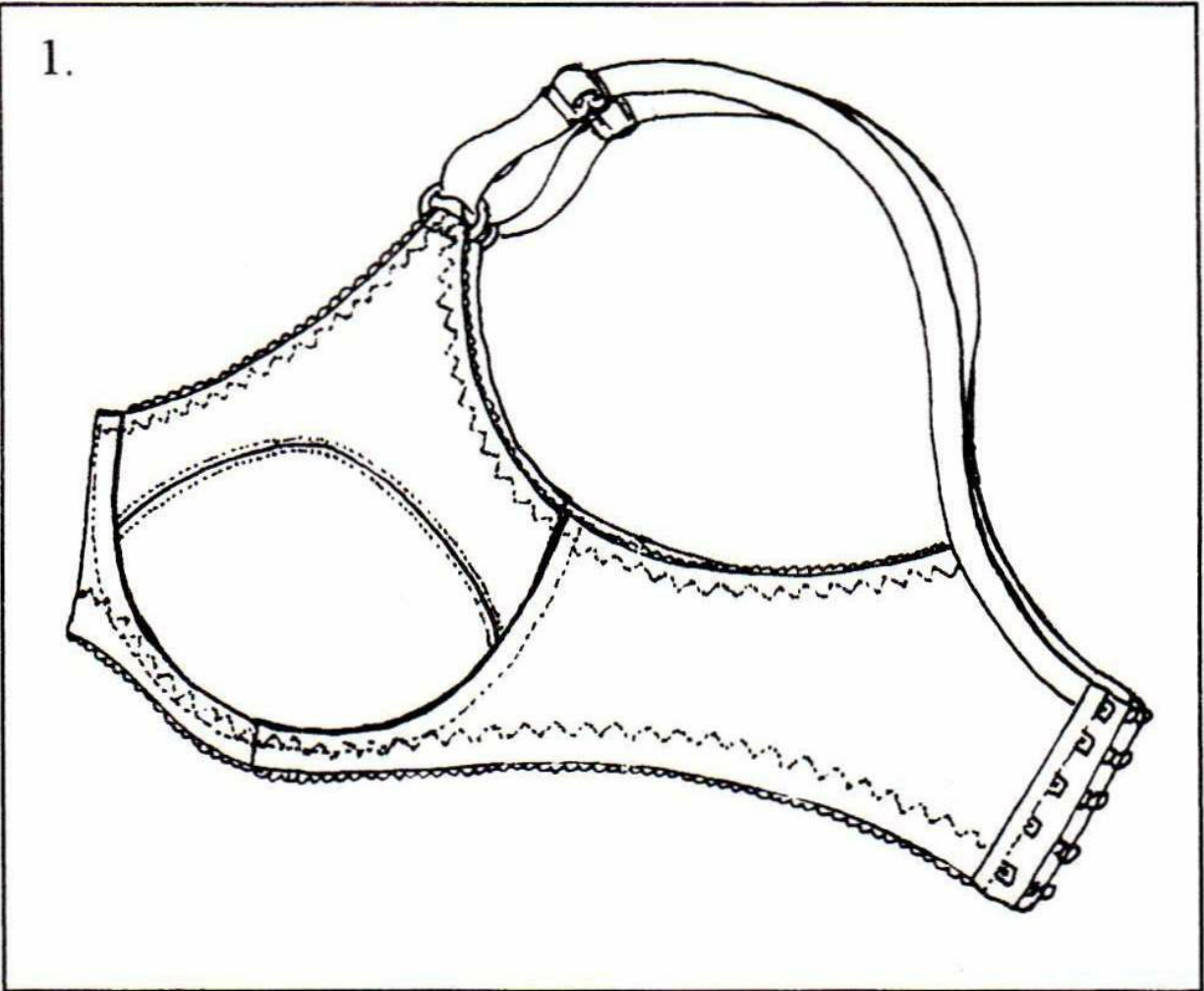
Front opening bras can be underwired or non-underwired. Because the closure is at the centre front between the cups, there is only space for a maximum of two banks of eyes (although a single bank of eyes is much preferable), making the front opening bra less adjustable than a regular back opening bra. If you sew a front opening bra and after wear, the spandex bra back fabric stretches, then the bra has to be 'taken in' by increasing the width of the centre back seam allowance and/or the side seam.

## Converting the Pattern of a Back Opening Bra into a Front Opening Bra

To convert your pattern into that of a front opening bra, firstly determine which bank of eyes you normally do your bra up on as this will indicate approximately the required width of the back pattern piece (around the ribcage).

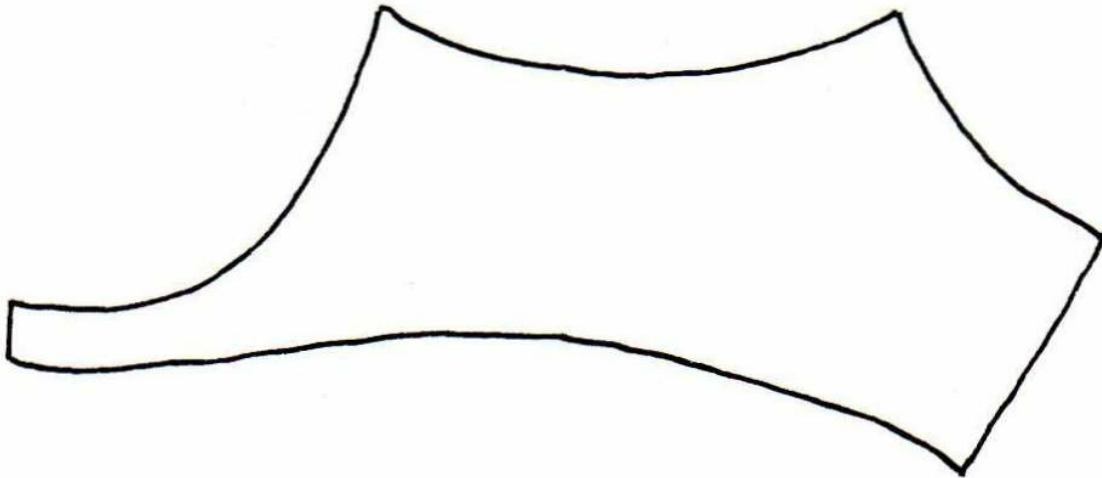
- Do the hooks up into this bank of eyes and fold your bra in half (folding along the centre front and at the centre back closure).  
Diagram 1.





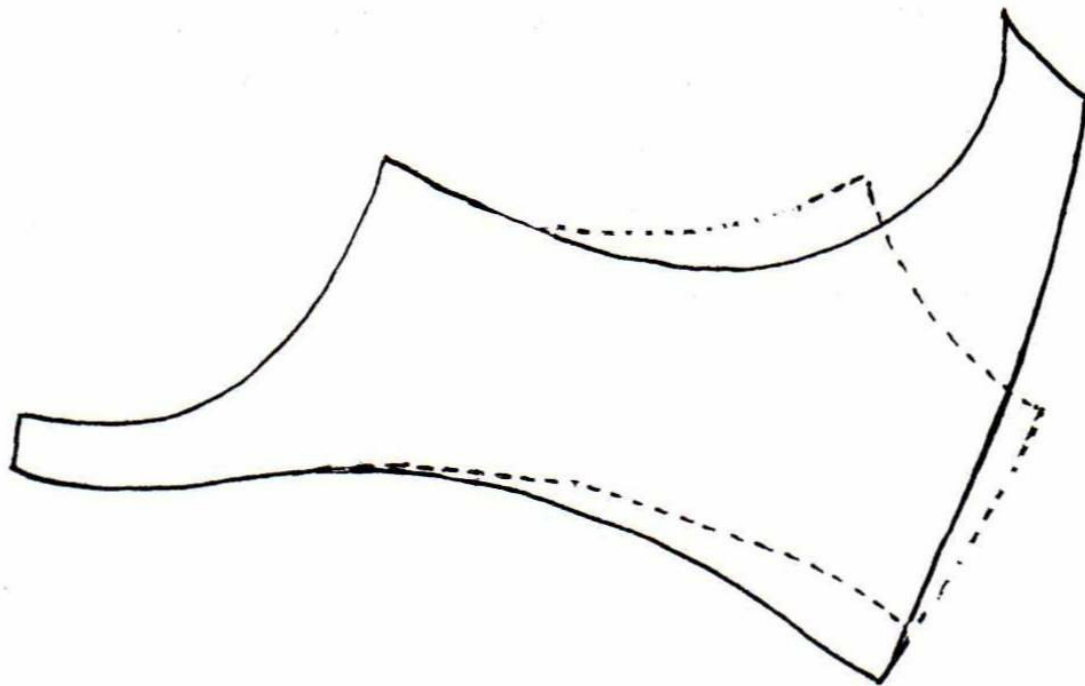
- Place 'do-sew' (pattern making fabric) over the bra back and trace the bra back tracing the fold line of the closure as the centre back edge (this fold line will become part of the new centre back seam). Diagram 2.

2



- Unpin the 'do-sew' and retrace the bra back altering its shape in a similar way to the example in Diagram 3, angling the lower edge gently down to the centre back, and incorporating the centre back fold line of the folded hook/eye closure into a gently-curved centre back seam shaped according to the natural shape of the rib cage.

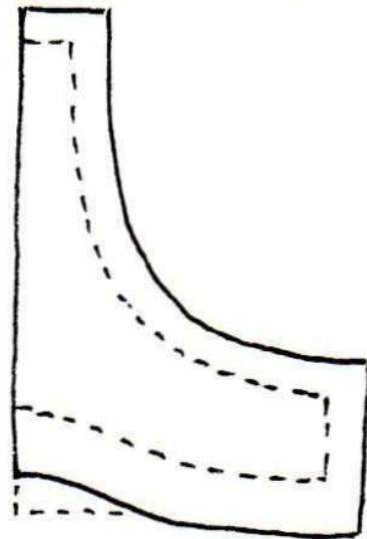
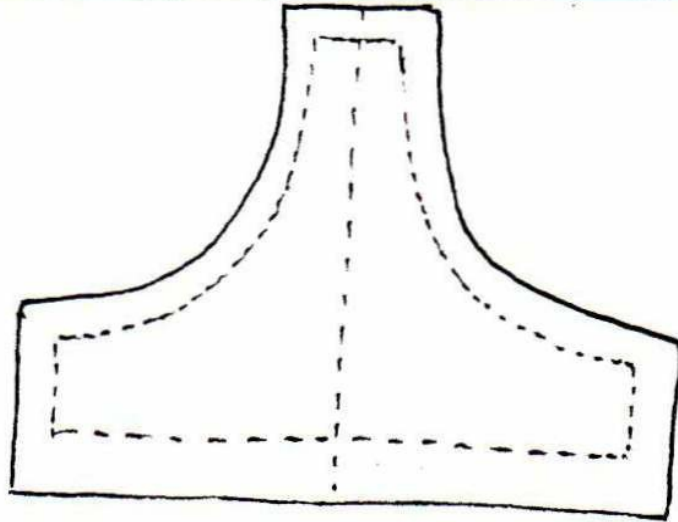
3



Original back pattern  
Altered back pattern

- Add 1cm seam allowances on all edges except for the lower edge where 2cm (the width of the lower elastic) is added.
- The centrepiece pattern piece is quite simply cut down the centre front. Do not add any seam allowance along the centre front as adding a seam allowance would make the centrepiece too wide.
- Using a length of hook and eye closure tape, determine the number of hooks/eyes at the centre front closure. You may need to slightly adjust the vertical length of the centre front opening to comfortably match the length of hook/eye tape you will be sewing onto it. If it needs to be a little shorter, shave a slight amount off the lower edge of the centrepiece. Diagram 4.

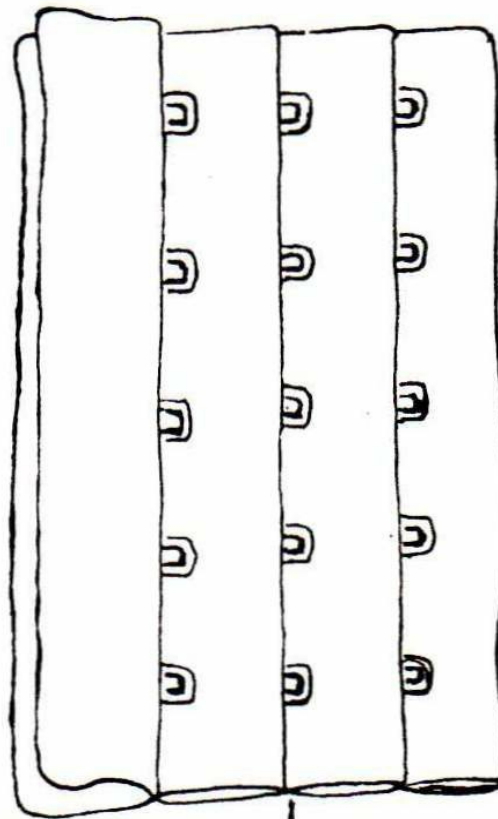
4



Original Centrepiece (top).

Altered Centrepiece (bottom)

5



Discard this  
side

cut along  
here (under the eyes)

use this side

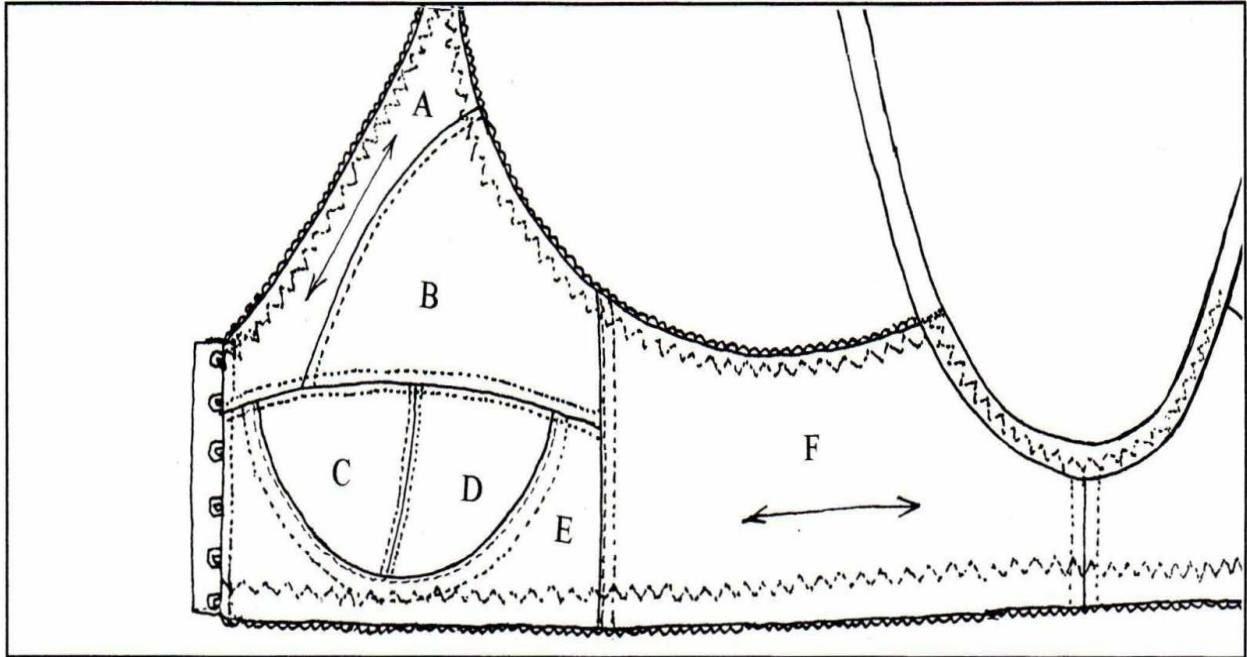
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(Diagrams are on the previous page)

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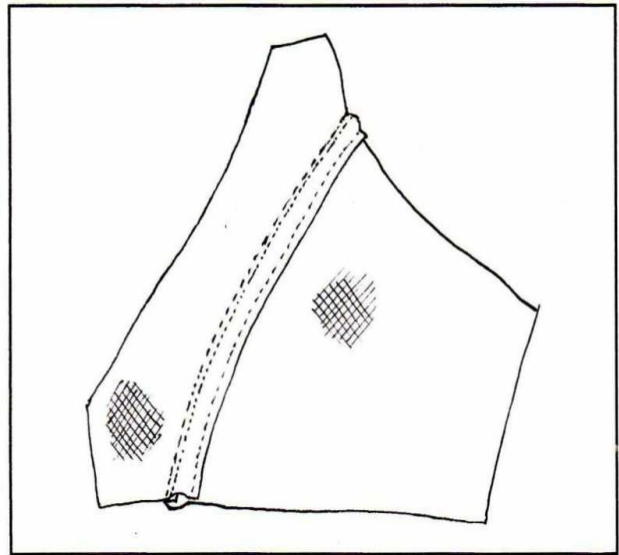
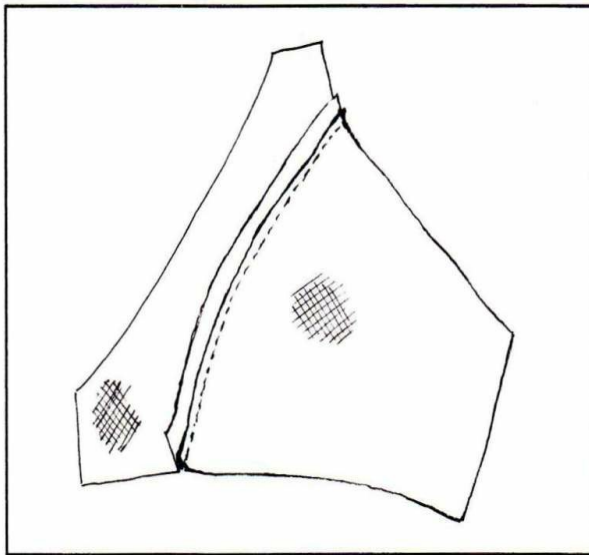
## Sewing Instructions for a Front Opening Bra





This bra has a Neckline Edge Piece, an Under-Cup Piece, an Upper cup, an Inner Lower Cup, an Outer Lower Cup and a Bra Back.

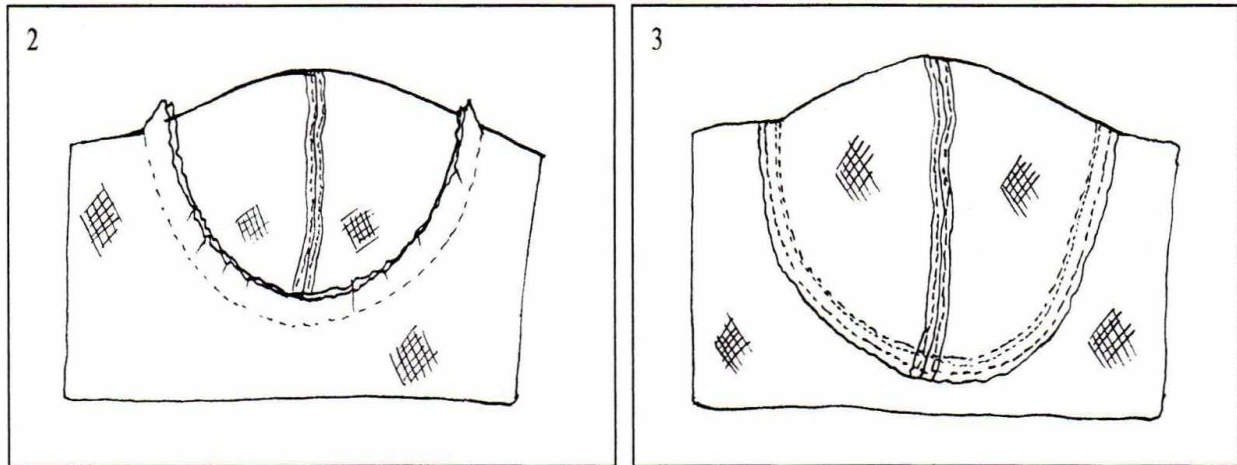
1. ***Seam the neckline edge piece to the upper cup*** using a 1cm allowance and a small straight stitch. Trim the upper-cup fabric raw edge back hard, turn the raw edges towards the side away from the neckline edge and top stitch down using a straight stitch.



2. ***Seam each outer lower cup to its matching inner lower cup*** using a 1cm seam allowance and a small straight stitch. Part the raw edges, one to either

side of the seam line and top stitch very close to the seam line as shown. Trim raw edges back hard.

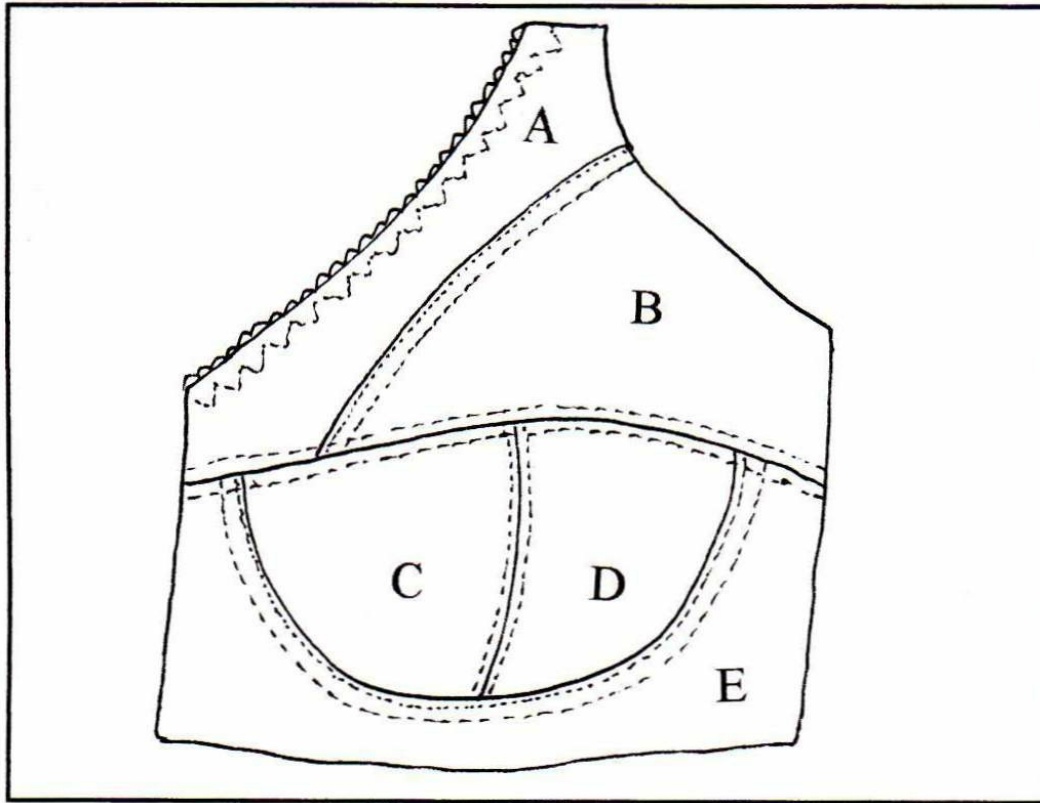
3. ***Seam each completed lower cup into its matching under-cup piece.*** Trim and top stitch the raw edges of this seam in a similar way to that described above in Step 1, trimming the raw edge of the under-cup piece back very hard, turning both edges downwards and top stitching as shown.



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4. ***Seam each combined upper-front to its matching combined lower front*** along the central horizontal seam. Part the raw edges one to each side of the seam line and top stitch them down very close to the seam line. Trim the raw edges back hard to the top stitching.

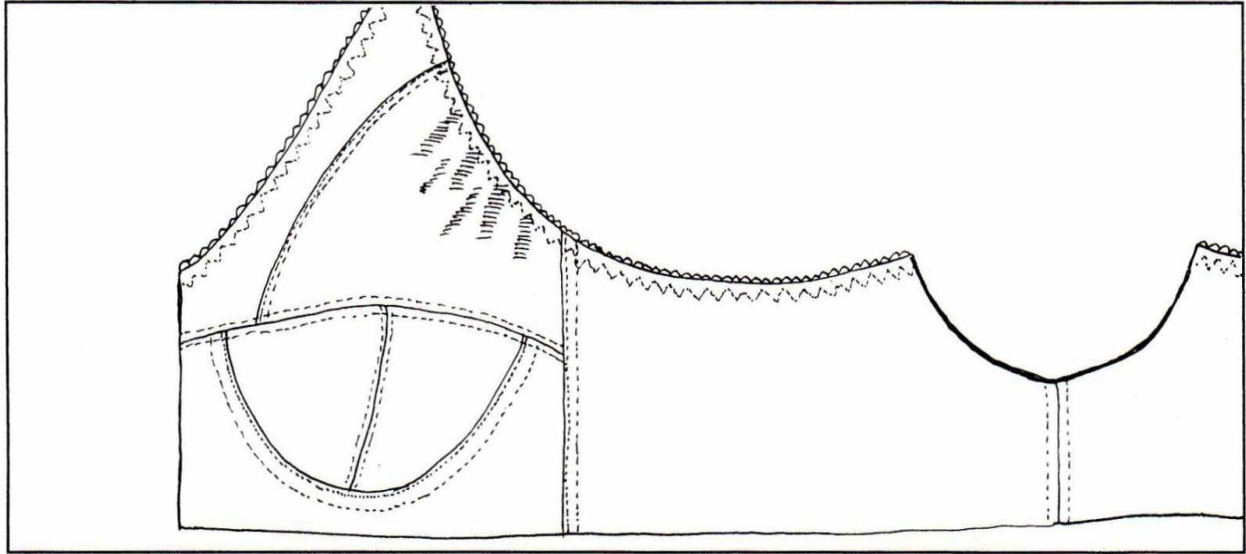
5. Using narrow scalloped elastic finish of each neck line edge of the front.



6. **Seam the bra back pieces together at the centre back.** Part raw edges and top stitch apart.

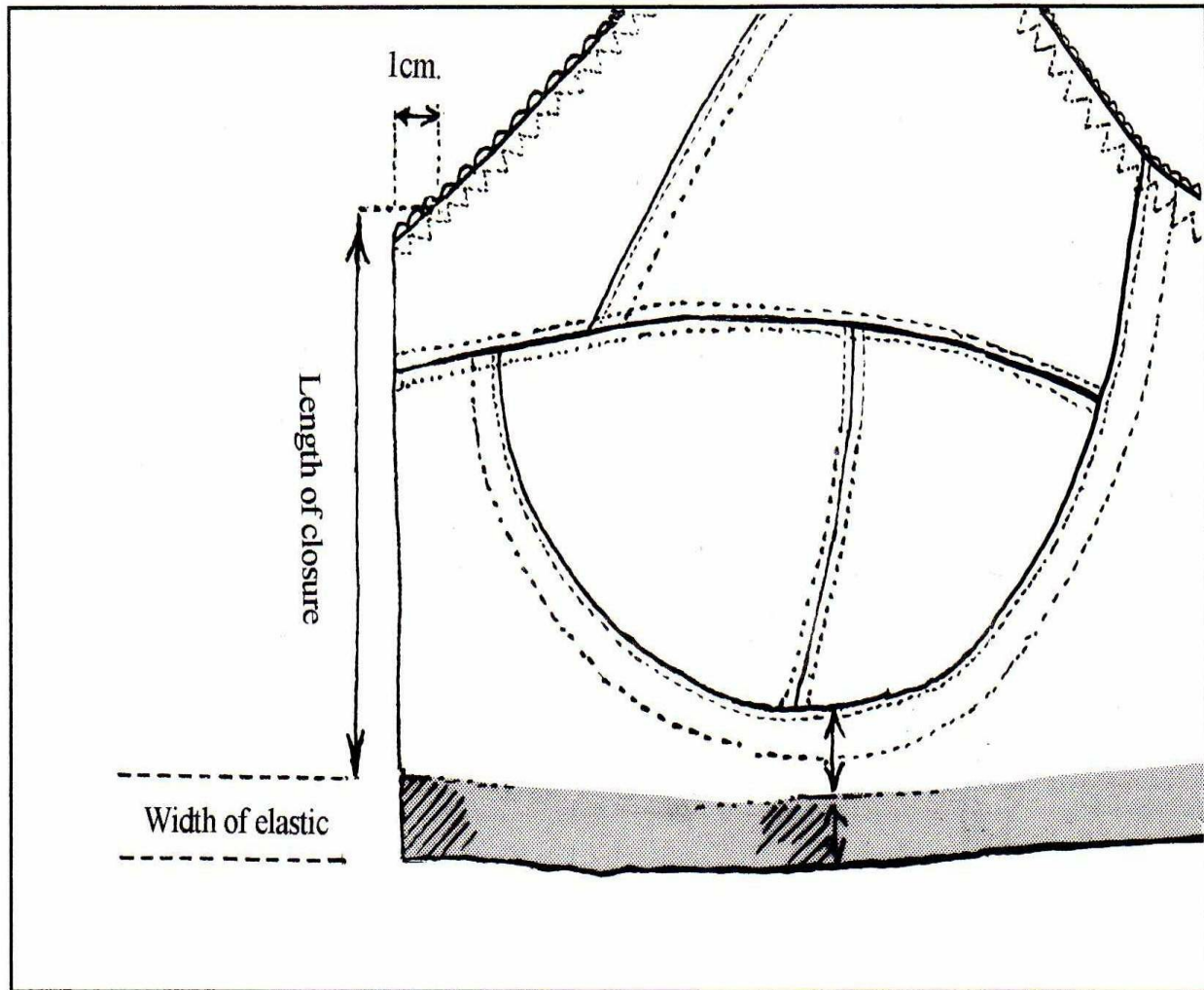
7. **Seam the entire bra back to each bra front** along the side seams. Trim the spandex/powernet raw edge back hard, turn both edges towards the back and top stitch.

8. **Sew narrow scalloped elastic to the total arm-hole edge**, stretching the elastic slightly at the side of the upper cup to prevent gaping. This edge extends from the top point of the upper cup front (where it passes through the ring) right around to where the strap elastic joins onto the bra back.



9. ***Apply wide lower edge scalloped elastic to the total lower edge*** making sure that: the elastic is sewn unstretched between the side seams across the back, all stretching-to-fit taking place across the lower front edge. The elastic is positioned at the front raw edge so that finished height of the front (1cm in from the raw edge) is the exact length of the closure tape. The elastic is positioned under the cup so that there is slightly more fabric between the finished lower edge and the 'wire line' seam than the width of the elastic itself. This is so that the elastic can be turned upwards comfortably and top stitched down before it reaches actual cup space.

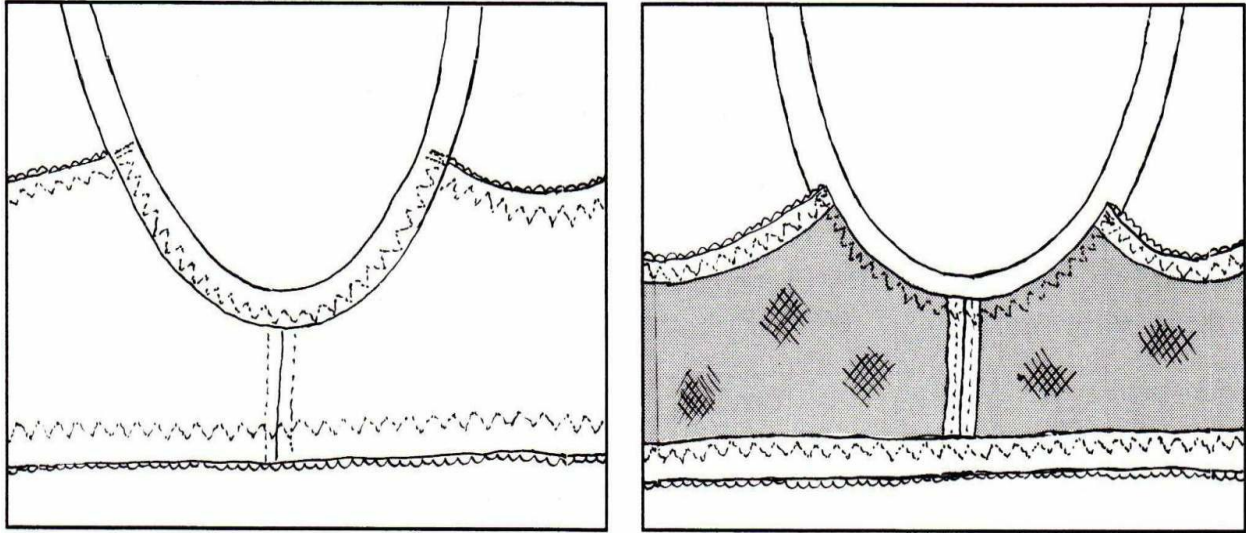
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10. ***Securely sew a ring to the top of each front.***

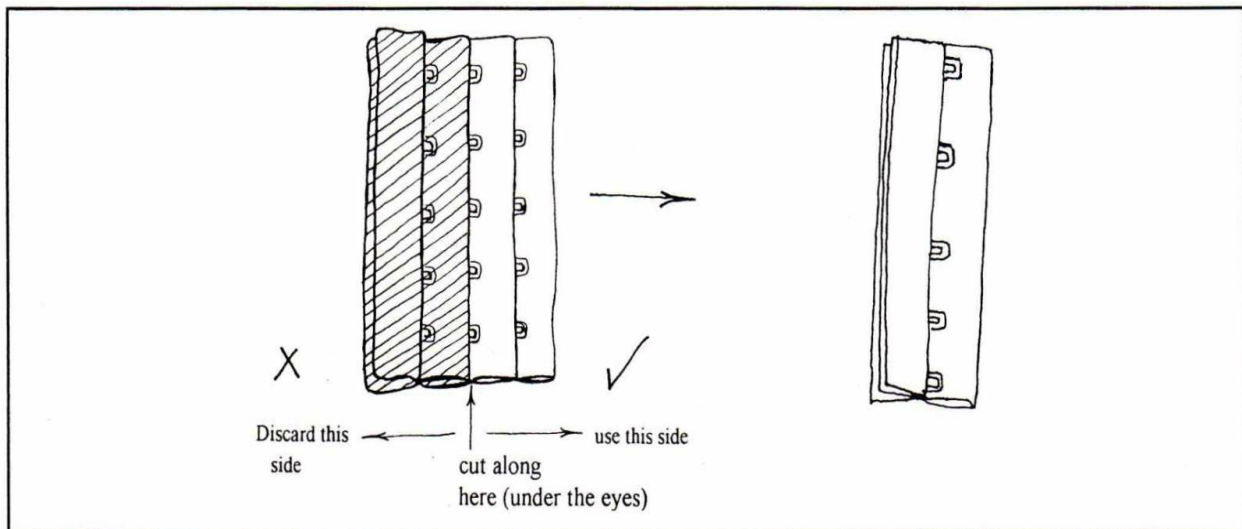
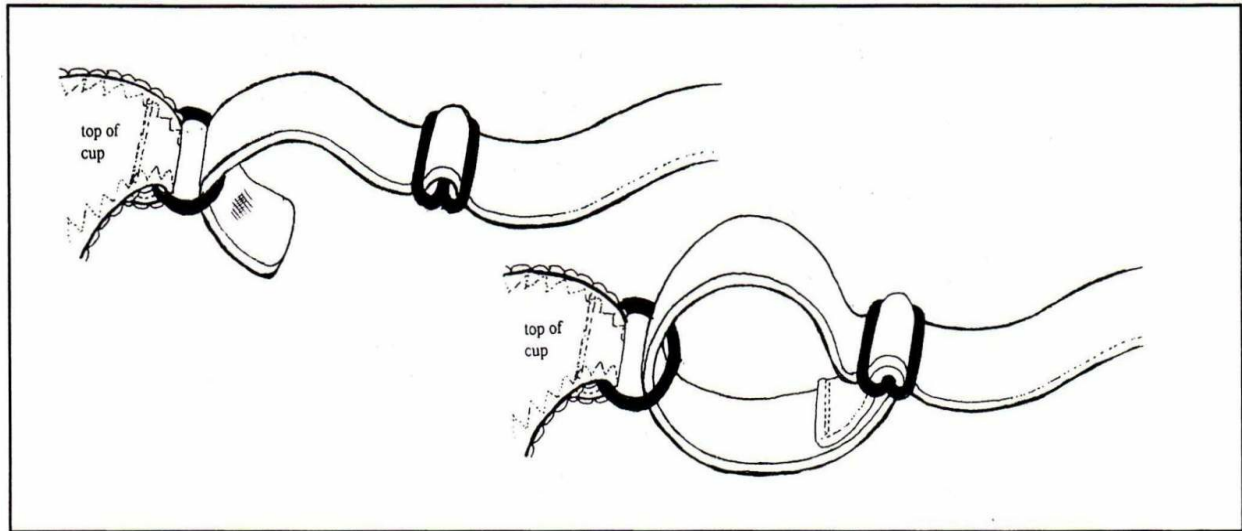
11. ***Assemble the straps.*** Mark the centre point of the total length of strap elastic. Assemble the strap as it comes off the top of one cup (refer to [page 105](#)). Match the mid-point of the strap with the centre back seam and stitch securely as shown in the diagram below left. Trim away any raw edge on the underside of the strap to neaten the finish.





12. To assemble the other end of the strap, refer to [page 186](#). Thread the other side of the strap (the one yet to be assembled) loosely up and over the central lug of its slide, down through the ring at the top of the cup. Keep the loops as loose as possible and use a pair of tweezers to make this threading easier. Loosen the loop around the central side lug so that it is very loose, and thread the strap up and through the back space of the slide, around the central lug and down through the front space of the slide as shown, so that the end is wedged between the top and bottom sections. Loosen the loop closest the ring so that it is very loose and sew the strap end securely to the underneath section of loop (the length of strap closest the body when the bra is worn).

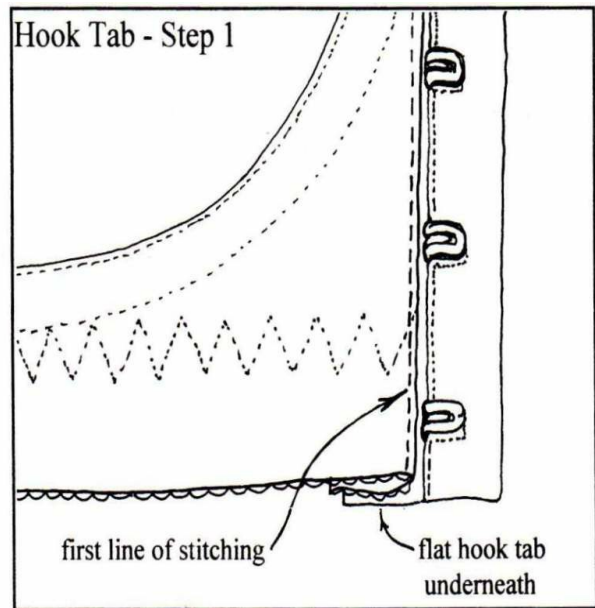
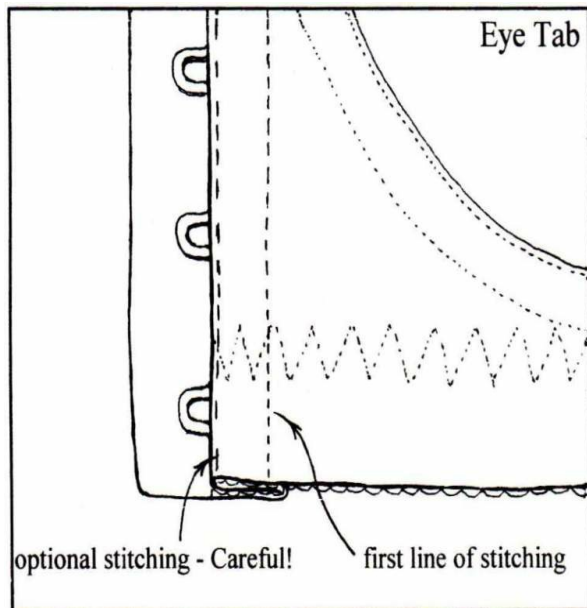
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13. **Apply the Central Closure.** For a right-handed person, the eye tab is sewn to the left body-side (as shown below) and vice versa for a left-handed person.

To prepare the blank of eyes, cut the tab vertically under the eyes as shown above.

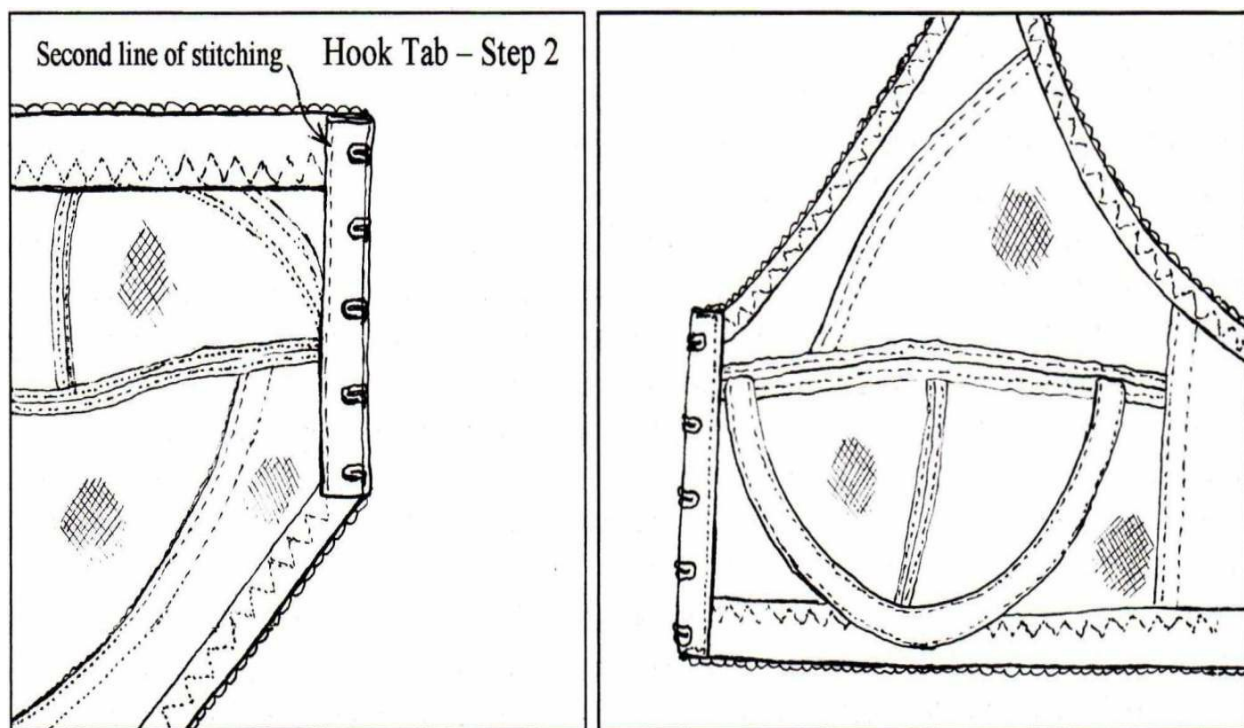
Fold the seam allowance under at the front edge and press flat. Lay the tab so that the eyes are positioned as indicated on the pattern pieces (right next to the finished edge of the fabric). Sew securely as shown taking care to position the line of stitching just clear of the metal anchors within the tab.



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Fold the seam allowance of the other half of the bra front under 1cm and press flat. Lay the hook tab so that the hooks themselves are just past the finished edge and facing away from the cup. At this stage the tab is opened out flat, as it is when it is bought as hook tape by the metre. Shift your needle position to the far right and/or put a zipper foot on your sewing machine. Straight stitch very close to the fold of the fabric securely.

Turn the bra over so that the wrong side of the fabric is facing you, and fold the tab towards you so that the metal hooks are on the inside of the bra. Stitch securely as shown below left.



13. To complete the bra you may wish to sew on two bows or sets of tiny beads just under the rings at the tops of the cups and if desired, underwire casing or bias binding can be stitched over the raw edges around the semi-circular seam joining the combined lower cup to the under-cup piece.

Diagram above right. Felt surfaced underwire casing will absorb perspiration and produce a more comfortable garment.

Because front-opening bras only have one bank of eyes, they are less adjustable than back-opening bras. As the spandex wears and loosens up, (and the bra is significantly too loose around the ribcage) the bra may have to be taken in at the centre back seam.

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## Quarter Cup Bras

Quarter cup bras are extremely decorative, semi-serious bras. In a quarter cup bra, the top neckline edge of the cup barely (if that) reaches the level of the nipple (this explains the name of this type of bra). For obvious reasons, they are only generally available in the stores in small cup sizes, but this fact should not daunt a very adventurous bra maker.

When making this type of bra for clients, I have come to realise the

following:

***Quarter cup bras work best where the nipple is naturally positioned quite high on the breast*** (i.e. if a quarter cup bra is made, and the nipple is situated low on the breast so that it lies within the lower cup where it can't be seen, then this defeats the whole purpose of the bra).

***A quarter cup bra will only provide minimal uplift:*** this is because it doesn't have an upper cup: it only has a fairly full (rounded) lower cup that the breast 'sits' on.

***The lower cup has to be quite full,*** as the breast has to have a secure 'shelf' to rest on. If the shelf is too narrow and/or flat/shallow in its shape, it won't adequately accommodate the bottom of the breast, then the breast will completely fall forward over it, again negating the reason for wearing a quarter cup bra. To increase the capacity of the lower cup, refer to [page 55](#).

***I suggest that the cup be made out of rigid fabric.*** This is because the only types of quarter cup bras that I have made have had rigid cup fabric (my method of converting a normal underwired bra into a quarter cup bra involves the selection of a bra that has rigid cup fabric). In theory I see no reason why a stretch fabric or lace cannot be used in the cup.

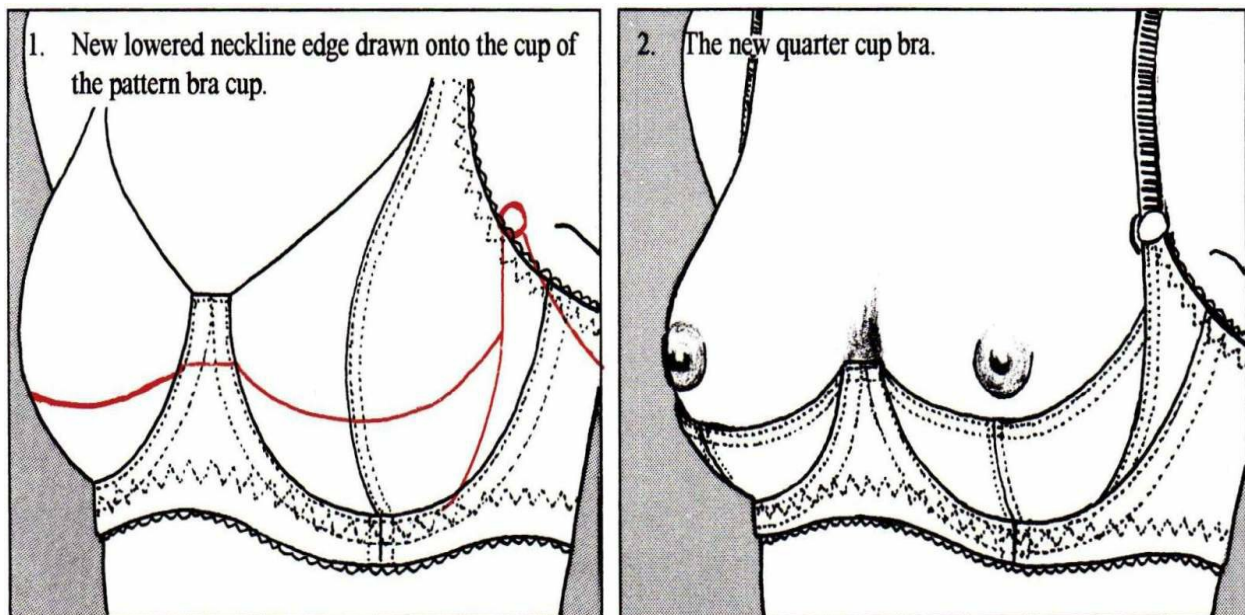
***When choosing a bra cup on which to base the pattern of a quarter cup, a firmly fitting bra cup should not be chosen.*** This is because a normal bra cup relies heavily on its upper cup to hold the breast firmly in against the chest wall and if its lower cup is used as a basis of the pattern, the breast will completely spill forward over the top edge of the quarter cup, defeating the purpose of the bra. If you wish to draft a pattern for a quarter cup bra

- ***Select an underwired bra that has rigid cup fabric, and that is a bit too big in its cup volume.*** There should be some empty space within the upper cup of this bra (the upper cup should be loose or 'blousey'.) This bra should provide adequate breast uplift, without the aid of its upper cup.
- ***Using a water wash out/ fade-out felt tip pen, draw the desired top edge of the quarter cup onto the surface of this pattern bra's cup.*** Draw this top edge with reference to the position of the nipple



within the cup. Also draw the new ring position which will probably be situated quite close to the armhole. I suggest that a side-cup piece be incorporated into the design of the cup and drawn onto the cup accordingly (refer to diagram 1). Alternatively, the ring can be threaded through a short length of strapping and the strapping loop can be sewn to the top edge of the cup close to the arm.

- Draft the pattern of this cup using normal drafting methods, cutting the cup apart along its seam lines, and ironing each piece flat, but then alter the neckline edge of the cup according to the lines you have drawn onto the cup surface. I suggest that you produce two cup patterns: one of the original pattern cup, and the other, the modified cup.



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## PRODUCING A CUP PATTERN FROM AN ACTUAL BREAST

Some women are in the extremely unenviable position of not being able to buy even one bra that fits them well, and they many never have had a bra fit them! The closest fitting bra may be many sizes too small in the cup. This is a desperate situation, and produces the ultimate challenge for the home bra maker. In the following pages I will detail a technique that is the best one

that I have so far been able to develop for producing a cup pattern from an actual breast.

It is a technique best suited for producing an underwired bra pattern only, and is not to be used by the 'faint-hearted', however desperate situations require desperate measures so here goes.

### ***Necessary Materials:***

1. Two to four rolls of 3-5 cm (1-2 inch) wide non-stretch adhesive bandaging tape from the chemist/drugstore ('micropore' is best as it isn't painful to remove)
2. 'Do-sew' or a similar type of pattern making fabric
3. A selection of underwires (or medium-thick gauge copper wire and some wire cutters/pliers)
4. Felt-tip pen
5. Scissors
6. Lanoline or Petroleum Jelly to protect the nipple area.

### ***THE METHOD***

The client who the bra is for, is to be topless and lies on her back on a table (with a low pillow under the head for comfort). A table is at a convenient working height for the person performing this 'operation' (the bra-pattern maker). After applying lanoline or petroleum jelly to the nipple area the client is to hold the breast which is closest to the pattern maker in a supported position as it would be in a bra. Ensure that the breast does not fall to the side of the torso (fall down towards the arm) The pattern maker should select the best fitting underwire: a wire that fits well is one that sits in the wire line crease (where the breast meets the ribcage). A wire should be selected and set aside. Using short straight strips which are overlapped, (5-7cm or so in length) the **wire line area under the breast, and the lower cup area** should be more or less covered with tape. Once this area is done the client should sit up and again hold her breast in an uplifted, supported position as it would be in a bra 'perfect' for her body.

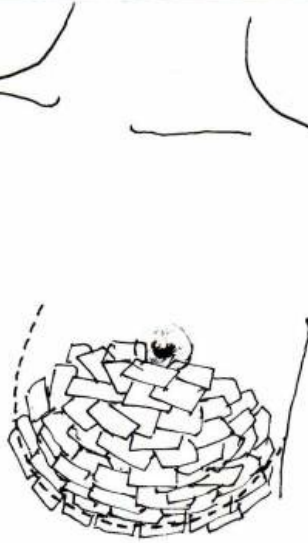
The pattern maker should then use overlapped strips of micropore to cover the surface of the rest of the breast, and to join the upper cup area to the lower cup area with overlapped strips that join the two. As you can imagine,

this isn't an easy operation to perform - especially if the breast is very large. The aim is to have the breast securely **taped into a supported position** that is in a pleasing cup shape: where there is adequate uplift and separation.

Once the breast surface has been covered with a thin layer of micropore tape, the 'shape' of the micropore cup can be more assertively worked on: perhaps using longer strips that correct any deficiencies of uplift or irregularities of shape.

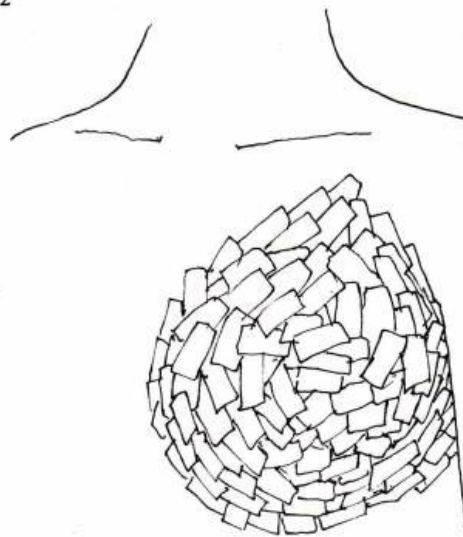
Using a felt-tip pen, **draw the neckline and armhole edge onto the micropore cup**, making the top point of the cup not directly above the nipple, but moved slightly towards the arm from this point (a bit of artistry is involved here). **The central cup seam line can then be drawn.** I suggest a horizontal seam line that goes through the nipple position, and if the breast is larger than an E fitting, consider having a **multi-piece cup**. Refer to the diagrams on [pages 70](#) and [71](#) for multi-piece cup design ideas. Three or more flat sections have a greater chance of successfully combining to give a smooth, rounded three-dimensional form. If the lower cup area (below the nipple line) is very full or rounded, consider having a multi-piece lower cup. Dividing the lower cup into multiple wedge-shaped sections will produce greater shaping or fullness in the lower cup area. After selecting your design **draw the cup seams onto the surface of the micropore cup with a felt-tip pen**. If you are drawing a central horizontal seam line, make it follow the shape of the breast, as if you were tracing along a ridge or the brow of a hill. At this stage you should have a micropore cup that is divided into component sections. The design of the cup should be drawn, and each section clearly labelled so that the cup 'jigsaw puzzle' design can be easily deciphered. **Each component section should be labelled and alignment letters clearly marked on it**, with 'C' denoting the centre, 'S' the side and 'T' the top of each piece.

1



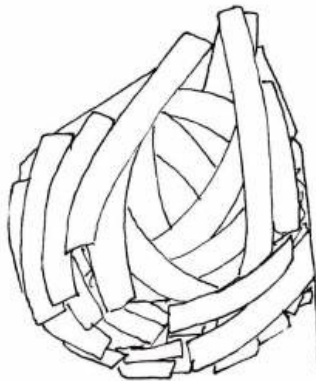
Overlapped short strips of micropore over the area of the lower breast. The client is lying down, holding her breast in a supported position as much as possible.  
-----approximate wire line

2



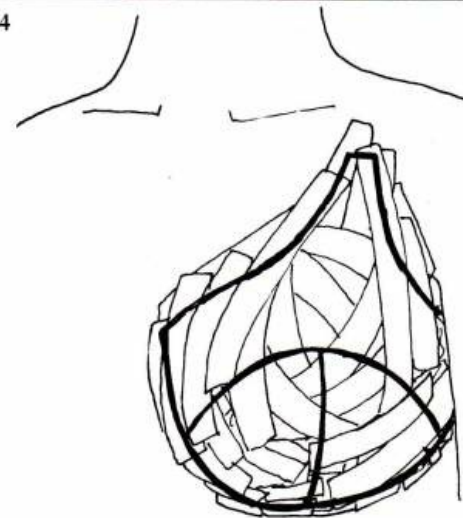
The client is sitting up holding the breast in a supported position and the breast is fully covered with micropore.

3



The client is sitting up, and longer strips are stuck over the shorter ones to increase the support that the cup gives and to attain the desired shape.

4



The outer edges of the cup, the wire line seam and the chosen cup seams are drawn onto the micropore cup with a felt-tip pen.

Once the micropore cup is finished and its seam lines drawn, ***the client carefully peels the micropore cup of her breast, gets dressed, and holds it so the pattern maker can trim the rough edges around the cup with scissors.***

- ***The cup should then be cut up along its seam lines***, and each cup piece stuck down onto a table surface. Don't worry if they don't quite sit flat (although the flatter they sit, the better). If the edges of each piece curl up a bit, simply nick them at 1cm intervals so that they can lie flatter. This will make each pattern piece marginally larger, but this can be later corrected.
- ***Accurately trace around each cup piece*** on its own separate piece of pattern making fabric. Include all centre, side and top directional markings as well as any alignment points (notches and symbols) that will indicate how the pieces link together.
- If you had to nick through any edges of the micropore cup in order to make it sit flat on the surface, you may at this stage shave a bit off (trim back) that edge so that the particular cup piece is not enlarged too much.
- ***Check the relative lengths of corresponding cup seam lines*** (refer to [page 35](#)).
- When you are satisfied with the drawing of each cup piece, add a 1cm seam allowance all around. Remember that the finished width at the top point of the cup should fit snugly through the ring. Also remember that there should be at least about 2cm of cup fabric above the armhole/side tip of the underwire and a little more than 1cm of cup fabric above the central tip of the underwire (the normal 1cm seam allowance).

The cups should be made using ***non-stretch fabric*** because the micropore was non-stretch: bonded lace is an excellent choice (a fine, non-stretch lace that is fused to rigid stabiliser). It is wise to make up a trial cup before making up a complete bra. If the lower cup is a bit too full, allowing the breast to sag somewhat within the cup, the seams within the lower cup can



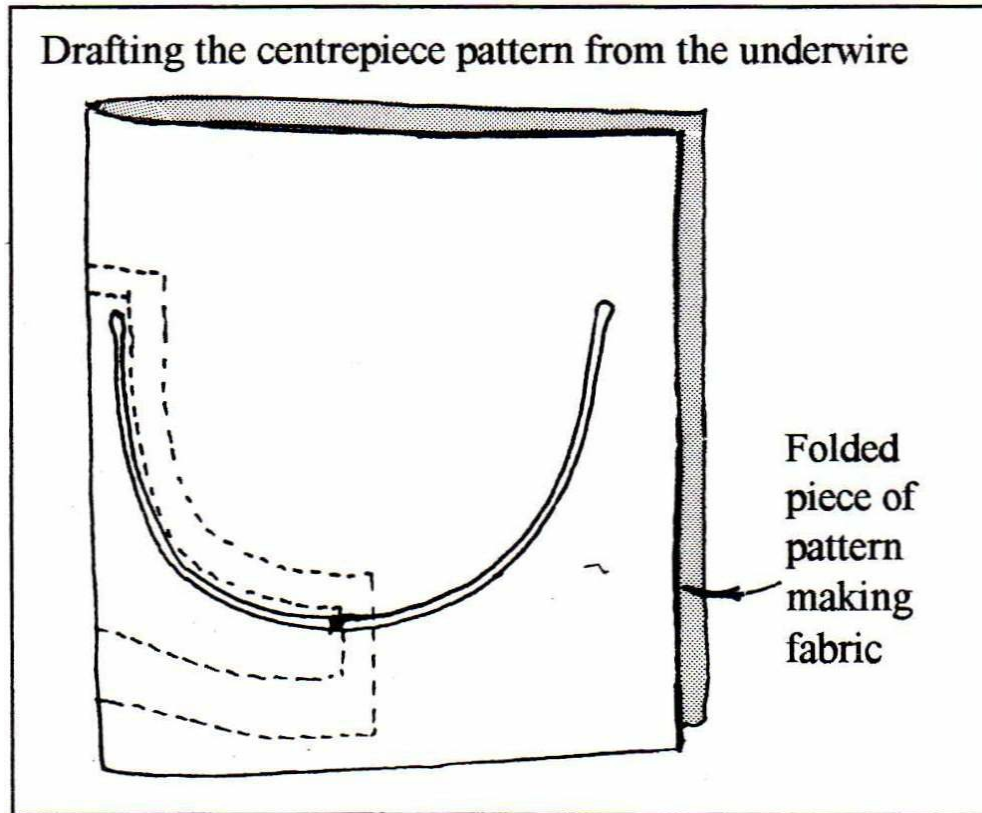
be tightened (increasing the seam allowance which is equivalent to reducing the size of the lower cup pieces) so that extra uplift is obtained.

Similarly, the seams within the upper cup can be enlarged so that extra fullness is obtained. To develop the rest of the bra pattern (the centrepiece and bra back) a measure of artistry and confidence is required (besides which, you should have read and understood the vast majority of 'Making Beautiful Bras' which is why this chapter is near its end).

To draw the centrepiece (a Y centrepiece bra is an easy choice), fold a piece of pattern making fabric in half, and pin it together in that folded position. Lay your chosen underwire on it with the central upright very close the fold in the pattern making fabric, (about 0.8 cm away from the fold) and trace the ***inside edge*** of the underwire around to its lowest point. To keep the wire from moving you may be able to stabilise its position with pins. The fold line of the pattern making fabric becomes the centre front fold of the centrepiece pattern.

Where the lowest point of the curve is, using a felt-tip pen mark that point on the actual wire with a dot. This dot will indicate the position of the seam line joining the inverted Y-shaped centrepiece to the side bra back.

Draw the seam line on the do-sew (down through the dot on the wire) so that the seam line is approximately 2cm long and then draw the lower edge of the centrepiece, gently curving it upwards at the lowest edge of the centre front. 1cm seam allowances can then be added around the centrepiece with a 2cm seam allowance along its lower edge. Refer to the diagram opposite. At this stage leave the wire laid on this piece of the pattern making fabric, as it will be needed to produce the bra back pattern piece.



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To produce the bra back pattern you will need the rib cage measurement of the client. Measure the distance from the fold of the pattern making fabric to the seam line joining the centrepiece to the bra back, and double this measurement to determine the finished width of the centrepiece. Subtract this total width of the centrepiece from the total ribcage measurement, and then **halve the answer**. The last part of this procedure is to **subtract 7cm** from this answer (which is an approximate stretch factor). Note that the bra back pattern is to be made out of a **single layer of spandex or powernet**.

$$\text{Finished Length of Bra Back Pattern Piece} = \frac{\text{Ribcage measurement} - \text{Centrepiece Width}}{2} - 7 \text{ cm}$$

This final measurement will be the distance from the seam (that joins the centrepiece to the bra back) to the raw edge at the closure. Once the finished length of the bra back pattern piece has been calculated the bra back pattern piece can be drafted as follows.

Using another larger flat piece of pattern making fabric, lay it over the sheet

that the centrepiece is drawn onto, pin it to the first piece (still folded with the wire still in position on it), trace the rest of the underwire along its inside edge. Add the required amount of fabric above the side tip of the wire (how far above the side tip of the wire did the cup fabric end?) by simply continuing the curve upwards. Mark the finished width of the bra back pattern piece and draw the bra back in a similar way to that indicated in the following diagram.

